Amphenol
SPECTRA-STRIP®

ISO 9002 Certified

PACER ELECTRONICS

ISO 9002 Certified

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ISO 9001 Registered

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cable/Spectra-Strip® quick reference guide

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New Products Up to the Challenge

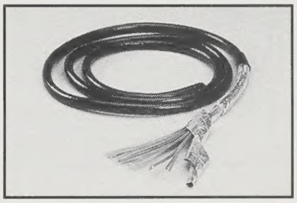
In today's electronics world, despite the sometimes radical changes in technology that assault us daily, you can still rely on high performance copper interconnect cabling being required to carry critical electrical signals from A to B. And you can count on the fact that these signals travel in physical and electrical environments that constantly push the envelope of what copper can traditionally handle.

In applications ranging from large scale massively parallel processors (MPP) and symmetric multiple processors (SMP) servers to telephone digital cross-connects to high speed automatic test equipment, these signals must travel with a minimum of time delay skew, and maximum crosstalk isolation. Cable losses over distance must be as small as possible. And because high frequency also generates heat, the cables must be as small as possible to aid airflow within the cabinet. Externally, they must be small and flexible, offering high degrees of EMI / RFI protection. Additionally, they must increasingly be constructed with zero halogenated materials to meet stringent European requirements for non-toxic, non-corrosive cable installations.

To meet these challenges, and to maintain our continuing industry leadership, Spectra-Strip has developed several new advanced products. Among them are:

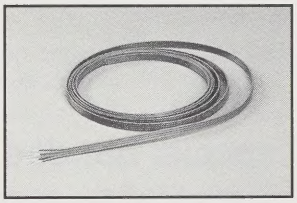
Parallel Pair, Low Skew Cable

In the data processing market, Spectra-Strip's new Low Skew Shielded Parallel Pair cable serves as a high bandwidth (1 Gigabyte) I/O channel connecting large scale massively parallel processors (MPP) and symmetric multiple processors (SMP) to workstations. In the telephony market, parallel pairs are used to link up racks of transmission equipment where STS 12 and STS 48 electrical signals interface with the fiber optic world. These are differential high frequency, high bit rate links, requiring extremely low wire-to-wire and pair-to-pair time delay / amplitude skew. Our unique design consists of 100 ohm pairs which are laid in parallel, with individual shields for crosstalk isolation. Pairs are then laminated in a planar configuration for further reduction in skew. For internal applications, board to board constructions are slit between pairs offering maximum flexibility. External I/O cables are doubly shielded for EMI/RFI protection and then jacketed with flexible PVC, both in flat and round formats. Zero Halogen options are available. Patent pending.



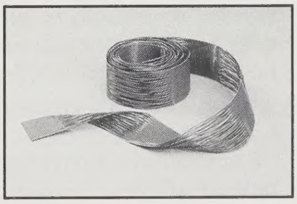
Miniature Flat Coax

For applications requiring high noise isolation and crosstalk protection in the smallest possible package, Spectra-Strip's new miniature flat multiple coaxial cable has signal transmission speeds up to 87 % VOP, and is offered in 50 and 75 ohm constructions. Cables utilize foamed polyolefin or expanded PTFE dielectrics, and are available from 36 awg to 30 awg. This new family of multiple planar coax has signals precisely positioned on .050" centers, twice the density of standard flat coax. Plus, the unique oriented drain wire feature allows for simplified mass stripping and termination to paddlecards.



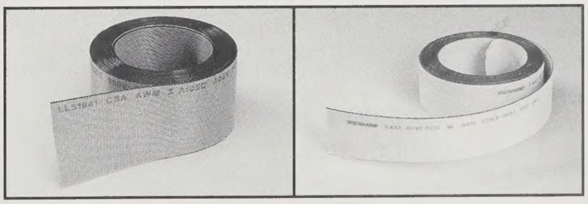
.025" Twist 'N' Flat

For internal single ended or differential SCSI applications requiring twisted pairs, Spectra-Strip now offers mass termination on .025" centers with its new .025" Twist'N'Flat. Unique in the industry, this is the only cable to offer programmable twist length sections (up to a maximum of 10) and loose, unbonded twisted pairs for a maximum in cable flexibility and improved airflow within the cabinet. Compared with traditional hand lamination methods, .025" Twist'N'Flat affords considerable end product cost savings.

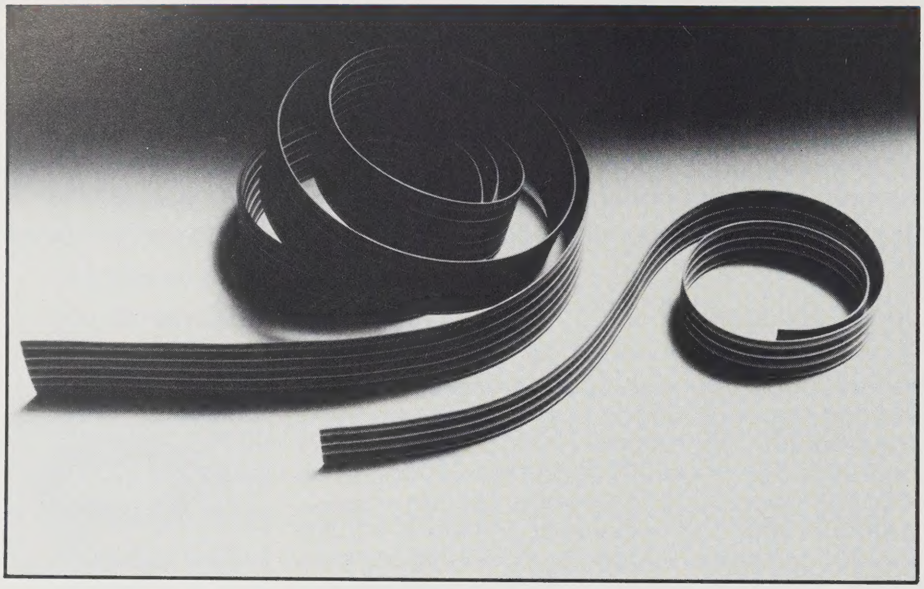


Fast 20/40 SCSI

Spectra-Strip's new Fast 20/40 SCSI cable is designed to comply with the recently released ANSI standard for Fast 20 SCSI devices operating at 20 MB data rates. Two versions of the cable are offered: 50 conductor 26 awg on .050" centers PVC for 8 bit narrow applications, and 68 conductor 30 awg on .025" centers for 16 and 32 bit wide applications. With the new cable, characteristic impedance is higher (and tighter) at 90 ± 6 ohms and signal to signal skew is controlled to within .036 ns/ft max, to accommodate the higher frequency fast 20 signals.



Spectra-Bond® parallel conductors — 111 series and Spectra-Bond® twisted pairs — 114 series



description

Bonded planar cable was originally developed, patented and introduced by Spectra-Strip. Bonded flat ribbon cables reduce both cost and packaging volume because they can be contour-formed, are self-supporting with minimum clamping, and can dissipate heat faster than round multi-conductor cable. They are used today in a great variety of interconnective systems using point-to-point wiring applications. These flat cables are fully compatible with standard termination techniques such as soldering, crimping and wire wrapping.

Spectra-Strip standard bonded cable consists of stranded or solid round conductors insulated with color-coded PVC and bonded together by a patented process to form a flat ribbon.

special bonded cables

Spectra-Strip has a highly versatile design and manufacturing capability for planar bonded PVC cables. A wide range of specialiy designed and produced constructions can be obtained by consulting the factory with specific requirements and cable descriptions.

Bonded constructions may be designed so that a single cable can contain several different wires or cables to provide a complete range of circuit functions including power, control, transmission and signalling.

A special cross-linked PVC insulation offering improved performance in resistance to heat and abrasion plus outstanding flame retardancy is also available. It is produced by exposure to a high-energy electron beam which cross-links the molecular structure of the PVC.

benefits

- Low cost point-to-point wiring
- Insulation easily separated for circuit routing
- Color coded
- Standard termination techniques
- Versatile applications
- UL recognized style

characteristics

Physical

— 111 series — parallel

Conductors: 22-30 AWG, 7 and 19 strand, tinned copper
Insulation: .010″ nom. wall, flame retardant PVC
Number of conductors: 2 to 100
Color code: brown, red, orange, yellow, green, blue, violet, gray, white, black (repeat)

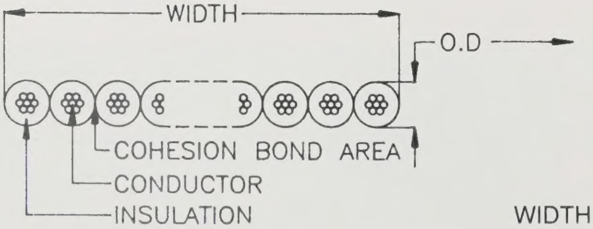
— 114 series — twisted pairs

Conductors: 22-30 AWG, 7 strand, tinned copper
Insulation: .010″ nom. wall, flame retardant PVC, .016″ nom. wall, flame retardant PVC available
Number of conductors: 2 to 100

Electrical

Voltage rating: 300 V per UL
Insulation resistance: 10^{10} ohms — 10 ft., min.
UL style number: Cable style 2697, cable style 2693
Temperature rating: 2697 (80°C, 300V), 2693 (105°C, 300V)
CSA: Available upon request

dimensions



30 AWG = .032" (0.81 mm)
28 AWG = .035" (0.89 mm)
26 AWG = .039" (1.00 mm)
24 AWG = .044" (1.12 mm)
22 AWG = .051" (1.30 mm)

WIDTH = (Number of Conductors) x (O.D.)

Spectra-Bond® parallel conductors and Spectra-Bond® twisted pairs

order information

— 111 series

Part No.	AWG	No. Cond.	STR	Nom. Width 'W' in.	(mm)	Approx. Wt./Roll lbs.	(kg)
843-111-3003-010	30	10	7/38	.32	(8,13)	.74	(0,34)
843-111-3003-015	30	15	7/38	.48	(12,19)	1.11	(0,50)
843-111-3003-020	30	20	7/38	.64	(16,26)	1.48	(0,67)
843-111-3003-030	30	30	7/38	.96	(24,38)	2.22	(1,01)
843-111-2803-010	28	10	7/36	.35	(8,89)	1.00	(0,45)
843-111-2803-015	28	15	7/36	.53	(13,34)	1.50	(0,68)
843-111-2803-020	28	20	7/36	.70	(17,78)	2.00	(0,91)
843-111-2803-030	28	30	7/36	1.05	(26,67)	3.00	(1,36)
843-111-2609-010	26	10	7/34	.39	(9,91)	1.42	(0,64)
843-111-2609-014	26	14	7/34	.55	(13,88)	1.99	(0,90)
843-111-2609-015	26	15	7/34	.59	(14,86)	2.13	(0,97)
843-111-2609-016	26	16	7/34	.63	(15,88)	3.18	(1,44)
843-111-2609-020	26	20	7/34	.78	(19,81)	2.84	(1,29)
843-111-2609-030	26	30	7/34	1.17	(29,72)	4.26	(1,93)
843-111-2413-010	24	10	7/32	.44	(11,18)	2.05	(0,93)
843-111-2414-010	24	10	19/36	.45	(11,43)	2.22	(1,01)
843-111-2413-015	24	15	7/32	.66	(16,76)	3.08	(1,40)
843-111-2414-015	24	15	19/36	.68	(17,15)	3.33	(1,51)
843-111-2413-020	24	20	7/32	.88	(22,35)	4.10	(1,86)
843-111-2414-020	24	20	19/36	.90	(22,86)	4.44	(2,01)
843-111-2413-030	24	30	7/32	1.32	(33,53)	6.15	(2,79)
843-111-2414-030	24	30	19/36	1.35	(34,29)	6.66	(3,02)
843-111-2213-010	22	10	7/30	.51	(12,94)	2.97	(1,35)
843-111-2214-010	22	10	19/34	.51	(12,94)	3.22	(1,46)
843-111-2213-015	22	15	7/30	.77	(19,43)	4.46	(2,02)
843-111-2214-015	22	15	19/34	.77	(19,43)	4.83	(2,19)
843-111-2213-020	22	20	7/30	1.02	(25,91)	5.94	(2,69)
843-111-2214-020	22	20	19/34	1.02	(25,91)	6.44	(2,92)
843-111-2213-030	22	30	7/30	1.53	(38,86)	8.91	(4,04)
843-111-2214-030	22	30	19/34	1.53	(38,86)	9,66	(4,38)

Standard sizes are stocked and packaged in 100 foot put-ups.

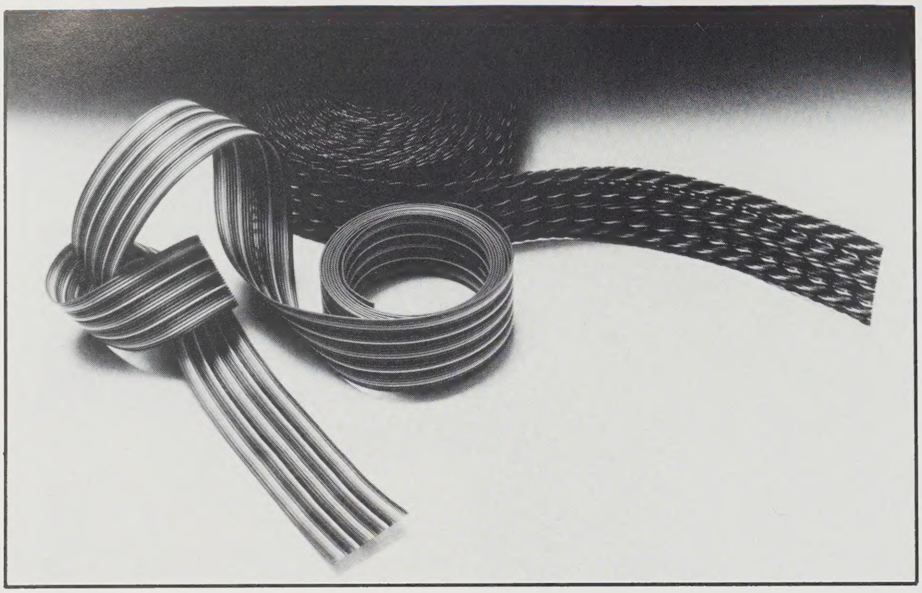
order information

— 114 series

Please consult factory for full information.

80°C, 300V cable may be certified under Canadian Standards Association (CSA) Appliances Wiring Material Program, (specify UL Style or CSA at time of order). For different wire gauges, number of conductors, color striping, materials and other special requirements, please consult the factory.

Ultra-Flex® parallel conductors
Ultra-Flex® twisted pairs — 112, 115 series



description

Spectra-Strip Ultra-Flex bonded planar cable is designed with great flexibility to meet applications which call for frequent or constant flexing without damage or alteration to electrical, mechanical or physical properties. Along with the Spectra-Bond cable, which was originally developed, patented and introduced by Spectra-Strip, Ultra-Flex is used in a great many interconnection applications with point-to-point wiring. It has the same advantages as Spectra-Bond cable — excellent bonding, separation, breakouts and termination techniques. These cables reduce both cost and packaging volume because they can be contour-formed, self-supporting with a minimum of clamping and can dissipate heat faster than round multi-conductor cable.

Standard Ultra-Flex bonded cables consist of stranded, round conductors insulated with color-coded PVC bonded together by a patented process to form a flat ribbon.

A wide range of specially designed constructions are also available, including special striping and color coding, plus an intermix of wire sizes. Consult the factory with your particular needs.

cable selection chart

AWG	Stranding	Copper Type	Insulation Thickness	Nominal OD/IN	Number of Conductors
30	26/44	Bare	B C	.035 (0,89) .046 (1,17)	2-100
26	64/44	Bare	C	.051 (1,30)	2-100
24	105/44	Bare	B C	.049 (1,24) .056 (1,42)	2-87
22	105/42	Tinned	B C	.052 (1,32) .062 (1,57)	2-80
20	105/40	Tinned	C	.072 (1,83)	2-73
18	105/38	Tinned	C	.086 (2,18)	2-62
16	105/36	Tinned	C	.096 (2,44)	2-56

B = wall thickness .010″ nominal
C = wall thickness .016″ nominal

benefits

- Highly flexible for continuous flexing operations
- Low-cost point-to-point wiring
- Easily separated for breakouts
- Contour formed
- Color coded
- UL recognized style ЯU

characteristics

Physical

— 112 series — parallel

Conductors: 16-30 AWG, 26 to 105 strands, bare or tinned copper
Insulation: .010″, .016″ nom. wall, flame retardant PVC
Number of conductors: 2-100
Flexibility: Continuous without damage to electrical, mechanical or physical properties

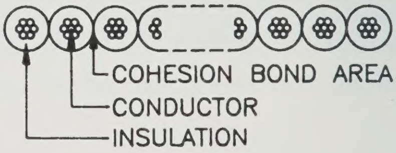
— 115 series — twisted pairs

Conductors: 16-30 AWG 26 to 105 strands, bare or tinned copper
Bare or tinned copper
Insulation: .010″, .016″ nom. wall flame retardant PVC
Number of conductors: 2-100

Electrical

Voltage rating: 300V per UL
UL style number: Cable Style 2697, Cable Style 2693
Temperature rating: 2697: 80°C (+176°F) 300V; 2693: 105°C (+221°F) 300V
Insulation resistance: 10^{10} ohms 10 ft.
CSA: Available upon request

dimensions

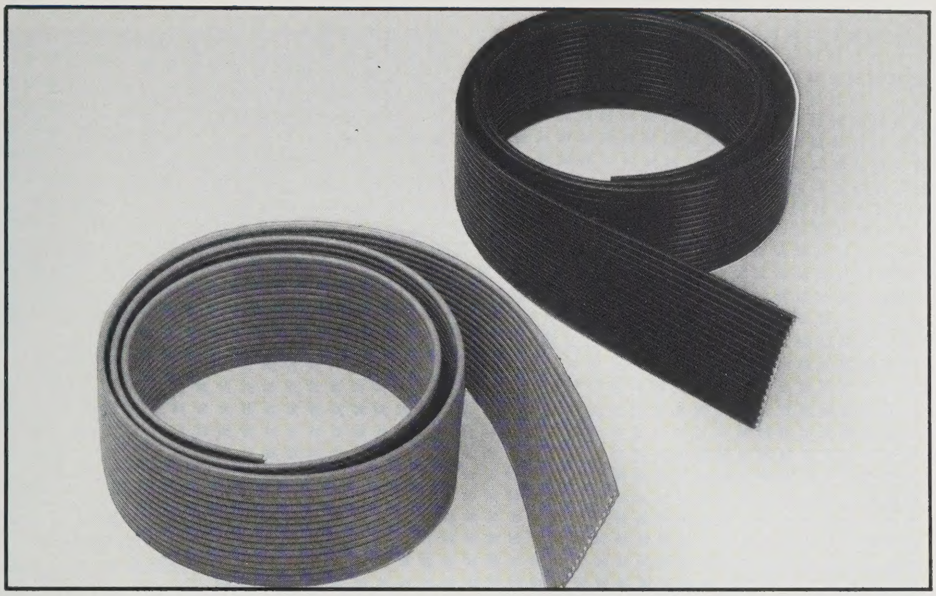


112 series

order information

Please consult factory for full information.

Spectra-Coax™ planar cable — 121 series



description

Spectra-Coax planar cable is the cable with high signal speed that can be mass terminated. Used in high-speed computers and other digital equipment, coax planar cable combines economy of time and money through reliability, space and labor savings.

Manufactured with controlled centers, Spectra-Coax cable consists of individual solid conductors, each with foamed or solid polypropylene insulation, a foil shield, and a drain wire. An extruded, contoured outer jacket allows mass termination or separation and stripping of conductors. This standard flat cable can be cut to any length and still maintain controlled centers.

Spectra-Strip can also custom design a coax planar cable for your exact needs. For other gauges, spacing and materials, please consult the Spectra-Strip factory.

order information

Series 121-3001 — 93 Ohm

Part Number	No. Conds.	Width "A"		Width "B"	
		Inch	(mm)	Inch	(mm)
843-121-3001-002	2	0.200	(05,08)	0.100	(02,54)
843-121-3001-003	3	0.300	(07,62)	0.200	(05,08)
843-121-3001-004	4	0.400	(10,16)	0.300	(07,62)
843-121-3001-005	5	0.500	(12,70)	0.400	(10,16)
843-121-3001-006	6	0.600	(15,24)	0.500	(12,70)
843-121-3001-007	7	0.700	(17,78)	0.600	(15,24)
843-121-3001-008	8	0.800	(20,32)	0.700	(17,78)
843-121-3001-009	9	0.900	(22,86)	0.800	(20,32)
843-121-3001-010	10	1.000	(25,40)	0.900	(22,86)
843-121-3001-013	13	1.300	(33,02)	1.200	(30,48)
843-121-3001-017	17	1.700	(43,18)	1.600	(40,64)
843-121-3001-020	20	2.000	(50,80)	1.900	(48,26)
843-121-3001-025	25	2.500	(63,50)	2.400	(60,96)
843-121-3001-030	30	3.000	(76,20)	2.900	(73,66)
843-121-3001-033	33	3.300	(83,82)	3.200	(81,28)

benefits

- High signal speed
- Controlled impedance
- Up to 33 conductors, with precise spacing for controlled electrical characteristics
- Mass termination
- Conductor separation and stripping
- UL recognized style

characteristics

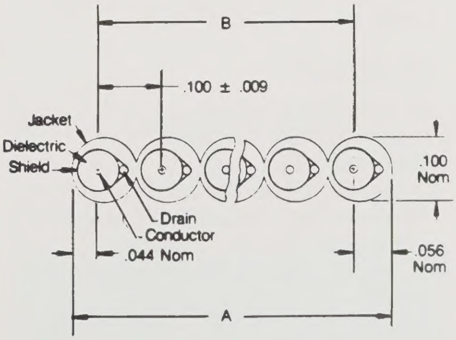
121-3001-0XX (93 Ohm)

Physical

Center conductor: 30 AWG copper, enamel coated (tinned coated available upon request)
Dielectric: Foamed polypropylene
Diameter: .064″ ± .002″
Drain Wire: 28 AWG tinned copper
Shield: Aluminum poly foil
Jacket: Red PVC, .017″ wall
Conductor spacing: .100″ ± .009″
Cable thickness: .100″ nom.

Electrical

UL style: 2741
Impedance: 93 ± 5 ohms
Capacitance: 14 ± 2 pf/ft. nom.
Crosstalk: <.1% NE and FE unbalanced, 10-foot cable length Risetimes: 3,5 or 7 nanosec.
Propagation delay: 1.35 nanosec./ft.
Velocity of propagation: 78%
Risetime degradation: <350 pico-sec/10 ft. (20-80%)
Attenuation: 6 db/100 ft. nom. (100 MHz)



Spectra-Coax™ planar cable — 121 series

characteristics

121-3002-0XX (75 Ohm)

Physical

Center conductor: 30 AWG copper, enamel coated (tinned coated available upon request)
Dielectric: Foamed polypropylene
Diameter: .047″ ± .002″
Drain Wire: 28 AWG tinned copper
Shield: Aluminum poly foil
Jacket: Gray PVC, .025″ wall
Conductor spacing: .100″ ± .009″
Cable thickness: .100″ nom.

Electrical

UL style: 2741
Impedance: 75 ± 4 ohms
Capacitance: 17.1 ± 1 pf/ft.
Crosstalk: <.1% NE and FE unbalanced, 10-foot cable length Risetimes: 3, 5 or 7 nanosec.
Propagation delay: 1.35 nanosec./ft.
Velocity of propagation: 78%
Risetime degradation: <350 picosec./10 ft. (20-80%)
Attenuation: 7.3 db/100 ft. nom. (100 MHz)

characteristics

121-2803-0XX (50 Ohm)

Physical

Center conductor: 28 AWG copper, enamel coated (tinned coated available upon request)
Dielectric: Solid polypropylene
Diameter: .041″ ± .002″
Drain wire: 28 AWG tinned copper
Shield: Aluminum poly foil
Jacket: Black PVC, .028″ wall
Conductor spacing: .100″ ± .009″
Cable thickness: .100″ nom.

Electrical

UL style: 2741
Impedance: 50 ± 3 ohms
Capacitance: 31 ± 1 pf/ft.
Crosstalk: <.1% NE and FE unbalanced, 10-foot cable length Risetimes: 3,5 or 7 nanosec.
Propagation delay: 1.54 nanosec./ft.
Velocity of propagation: 66%
Risetime degradation: <400 picosec./10 ft. (20-80%)
Attenuation: 11 db/100 ft. nom. (100 MHz)

order information

Series 121-3002 — 75 Ohm

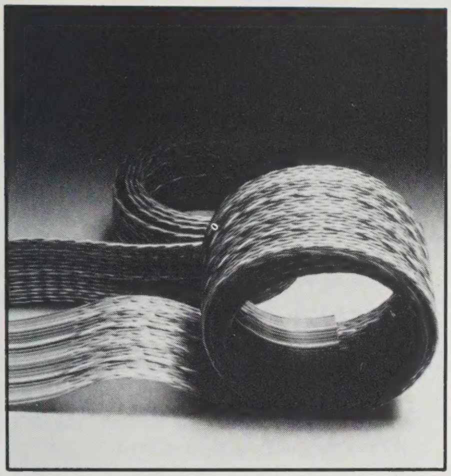
Part Number	No. Conds.	Width “A”		Width “B”	
		Inch	(mm)	Inch	(mm)
843-121-3002-002	2	0.200	(05,08)	0.100	(02,54)
843-121-3002-003	3	0.300	(07,62)	0.200	(05,08)
843-121-3002-004	4	0.400	(10,16)	0.300	(07,62)
843-121-3002-005	5	0.500	(12,70)	0.400	(10,16)
843-121-3002-006	6	0.600	(15,24)	0.500	(12,70)
843-121-3002-007	7	0.700	(17,78)	0.600	(15,24)
843-121-3002-008	8	0.800	(20,32)	0.700	(17,78)
843-121-3002-009	9	0.900	(22,86)	0.800	(20,32)
843-121-3002-010	10	1.000	(25,40)	0.900	(22,86)
843-121-3002-013	13	1.300	(33,02)	1.200	(30,48)
843-121-3002-017	17	1.700	(43,18)	1.600	(40,64)
843-121-3002-020	20	2.000	(50,80)	1.900	(48,26)
843-121-3002-025	25	2.500	(63,50)	2.400	(60,96)
843-121-3002-030	30	3.000	(76,20)	2.900	(73,66)
843-121-3002-033	33	3.300	(83,82)	3.200	(81,28)

order information

Series 121-2803 — 50 Ohm

Part Number	No. Conds.	Width “A”		Width “B”	
		Inch	(mm)	Inch	(mm)
843-121-2803-002	2	0.200	(05,08)	0.100	(02,54)
843-121-2803-003	3	0.300	(07,62)	0.200	(05,08)
843-121-2803-004	4	0.400	(10,16)	0.300	(07,62)
843-121-2803-005	5	0.500	(12,70)	0.400	(10,16)
843-121-2803-006	6	0.600	(15,24)	0.500	(12,70)
843-121-2803-007	7	0.700	(17,78)	0.600	(15,24)
843-121-2803-008	8	0.800	(20,32)	0.700	(17,78)
843-121-2803-009	9	0.900	(22,86)	0.800	(20,32)
843-121-2803-010	10	1.000	(25,40)	0.900	(22,86)
843-121-2803-013	13	1.300	(33,02)	1.200	(30,48)
843-121-2803-017	17	1.700	(43,18)	1.600	(40,64)
843-121-2803-020	20	2.000	(50,80)	1.900	(48,26)
843-121-2803-025	25	2.500	(63,50)	2.400	(60,96)
843-121-2803-030	30	3.000	(76,20)	2.900	(73,66)
843-121-2803-033	33	3.300	(83,82)	3.200	(81,28)

Twist 'N' Flat® planar cable — 132 series



benefits

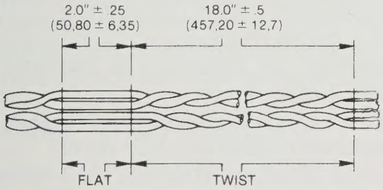
- Unique design allows mass termination to IDC connectors.
- Up to 64 conductors (32 pairs) with precise spacing for controlled electrical characteristics.
- Highly flexible PVC insulation, color coded.
- Double contour at flat sections allows termination from either side of cable.
- Easy conductor separation for circuit routing.
- UL recognized ℜ
- CSA certified, available

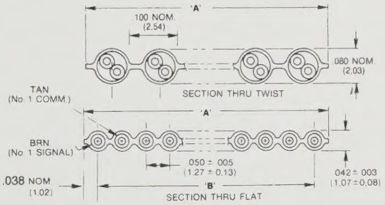
description

Spectra-Strip Twist 'N' Flat cable combines the time and cost savings of mass termination with the electrical performance of twisted pairs, making it ideal for high speed computers and communications equipment. Labor savings of up to 95% as compared to automatic strip and crimp termination are readily achieved.

Twist 'N' Flat cable consists of stranded round conductors insulated with color-coded PVC, twisted into pairs and laminated between layers of PVC film to form a planar cable. The twist in adjacent pairs is reversed to reduce cable crosstalk even further. Standard cables alternate 18-inch (45,7 cm) long twisted pair sections with 2 inch (5,1 cm) flat sections in which the conductors are laminated in parallel. Twist 'N' Flat cable is packaged in 100-foot putups in dispenser boxes.

Twist 'N' Flat cable can also be fabricated to your custom requirements. Flat sections can be made longer to allow room for multiple connectors. Twisted pair length can be varied from a minimum of 6 inches to many feet to conform with your requirements. The lamination can be fabricated "loose" at specified points to provide easy access to individual conductors. For complete details, consult the Spectra-Strip factory nearest you.





order information

Series 843-132-2801 28 AWG, 7/36 .050" centers

Part Number	No. Pairs	Width 'A'		Span "B"	
		Inch	(mm)	Inch	(mm)
843-132-2801-010	5	.526	(13,36)	.450 ± .015	(11,43 ± 0,38)
843-132-2801-014	7	.726	(18,44)	.650 ± .015	(16,51 ± 0,38)
843-132-2801-016	8	.826	(20,98)	.750 ± .015	(19,05 ± 0,38)
843-132-2801-020	10	1.026	(26,06)	.950 ± .015	(24,13 ± 0,38)
843-132-2801-026	13	1.326	(33,68)	1.250 ± .015	(31,75 ± 0,38)
843-132-2801-034	17	1.726	(43,84)	1.650 ± .015	(41,91 ± 0,38)
843-132-2801-036	18	1.826	(46,38)	1.750 ± .015	(44,45 ± 0,38)
843-132-2801-040	20	2.026	(51,46)	1.950 ± .020	(49,53 ± 0,51)
843-132-2801-050	25	2.526	(64,16)	2.450 ± .020	(62,23 ± 0,51)
843-132-2801-060	30	3.026	(76,86)	2.950 ± .020	(74,93 ± 0,51)
843-132-2801-064	32	3.226	(81,94)	3.150 ± .025	(80,01 ± 0,64)

characteristics

Physical

Conductors: 28 AWG, 7/36 strand, tinned copper
Conductor insulation: .010" nom. wall
Number of conductors: 10, 14, 16, 20, 26, 34, 36, 40, 50, 60 and 64
Color code: Brown, red, orange, yellow, green, blue, violet, gray, white, black (repeat) tan common
Conductor spacing: Twisted pair centers: .100" nom.; conductor centers in flats: .050" ± .005"
Cable thickness: .042" ± .003" (flat section)
Laminate: Clear PVC, self-extinguishing

Electrical

Voltage rating: 300 V
Current rating: 1 amp nom. at 10°C above ambient
Temperature rating: 80°C
Impedance: 100 ohms nom.
Capacitance: 15 pf/ft. (49 pf/m) nom.
Crosstalk: 10' sample, 5 ns rise time. Unbalanced (2 lines driven): NE = 4.0%, FE = 3.5% nominal. Balanced line: NE = .7%, FE = .45%
Propagation delay: 1.6 ns/ft. (5.2 ns/m) nom.
Insulation resistance: 10^{10} ohms 10 ft. (3 m) min.
UL style number: Cable style 2697 (80°C), Cable style 20130 (105°C), Component wire style 1061 or 1731.
CSA: Cable may be certified under Canadian Standard Association (CSA) Appliance Wiring Material Program (Specify at time of order); CSA AWM I A80°C, 300 V, FT-1.

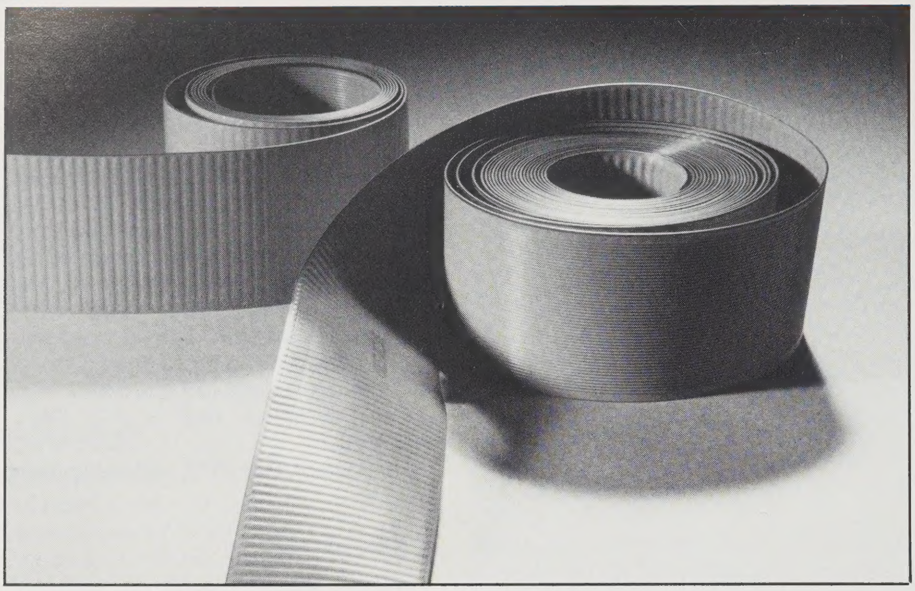
other capabilities

Twist 'N' Flat cable is available in the following gauges and spacings: consult factory.

Centers	AWG (Wire Size)
.050"	30, 28, 26, solid and stranded
.0625"	30, 28, 26, solid and stranded

Consult factory for special Twist 'N' Flat length capabilities.

Qwik Strip® ground plane planar cable — 133-2803, 2804 series



description

Take the work out of ground-plane cable preparation. No more time-consuming and messy, abrasive stripping equipment. Just notch or cut edge to length of strip needed, then use your fingers to peel back the lamination. The labor savings are enormous.

Qwik-Strip cable, while still keeping the proven design for controlling both crosstalk and EMI/RFI, is ideal for inter-connection applications. It is particularly well suited for computer and communications equipment that use high-speed techniques for switching and data transmission.

order information

Series 133-2803 with drain wire (black edge)

Part Number	No. Cond.	Width 'A'		Span 'B'	
		In.	(mm)	In.	(mm)
843-133-2803-020	20	1.250	(31,75)	0.950±010	(24,13)
843-133-2803-026	26	1.550	(39,37)	1.250±010	(31,75)
843-133-2803-034	34	1.950	(49,53)	1.650±010	(41,91)
843-133-2803-040	40	2.250	(57,15)	1.950±010	(49,53)
843-133-2803-050	50	2.750	(69,85)	2.450±010	(62,23)
843-133-2803-060	60	3.250	(82,55)	2.950±010	(74,93)

Series 133-2804 without drain wire (red edge)

Part Number	No. Cond.	Width 'A'		Span 'B'	
		In.	(mm)	In.	(mm)
843-133-2804-020	20	1.250	(31,75)	0.950±010	(24,13)
843-133-2804-026	26	1.550	(39,37)	1.250±010	(31,75)
843-133-2804-034	34	1.950	(49,53)	1.650±010	(41,91)
843-133-2804-040	40	2.250	(57,15)	1.950±010	(49,53)
843-133-2804-050	50	2.750	(69,85)	2.450±010	(62,23)
843-133-2804-060	60	3.250	(82,55)	2.950±010	(74,93)

benefits

- Quick easy cable preparation
- Cost savings in termination labor
- Consistent peel back
- Proven design for controlling both crosstalk and EMI/RFI
- UL recognized style
- CSA available

characteristics

Physical

Conductors and drain wire: 28 AWG, 7/36 strand, tinned copper

Ground plane: .005″ (0,13mm) expanded copper mesh

Number of conductors: 20, 26, 34, 40, 50, 60

Conductor spacing: .050″±.002″ (1,27±0,05)

Laminate: Gray PVC, flame retardant

Edge marking: 2803 series (with drain wire) black edge.

2804 series (without drain wire) red edge.

Cable thickness: .055″ (1,40mm) nom.

Electrical

Voltage rating: 300 V

Current rating: 1 amp nom. at 10°C above ambient

Temperature rating: 105°C (221°F)

*Impedance: 65 ohms nominal

*Capacitance: 29 pf/ft. (95 pf/m) nominal @ 1MHz

Propagation delay: 1.65 ns/ft. (5.2 ns/m) nominal

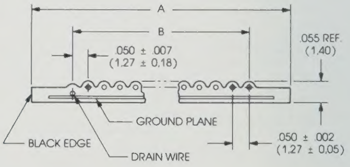
Crosstalk: 10′ sample: 5 ns rise time with 2 lines driven

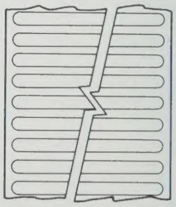
NE = 1.2%, FE = 3.5%

Insulation resistance: 10^{10} ohms — 10 ft.

UL style number: Cable style 2682

*Measured from conductor to ground plane.





BOTTOM VIEW OF CABLE

3C® color coded planar cable — 135 series

- Fast, low-cost mass termination.
- Precise spacing for controlled electrical characteristics.
- Color coded for easy identification.
- Double contour allows termination from either side of cable.
- Easy conductor separation for circuit routing.
- UL recognized
- CSA certified, available

description

3C Controlled Characteristics Cable is ideal for applications in digital and analog signal transmission. 3C color-coded cables are designed for mass-termination techniques including Spectra-Strip IDC connectors. With conductor centers the same as the contact centers of the connector, separation and stripping of individual conductors is completely eliminated. The color coding allows easy circuit tracing and routing.

Spectra-Strip 3C color-coded cable consists of stranded round conductors preinsulated with color-coded PVC and laminated on specific centers between layers of clear PVC film to form a planar cable. 3C cable is available in 100-foot putups, packaged in dispenser boxes.

Spectra-Strip has the ability to custom design a ribbon cable for your exact needs. We can provide you with exact electrical and mechanical characteristics by varying the conductor spacing and cable insulation. For custom designs, please consult the Spectra-Strip factory.

characteristics

Physical

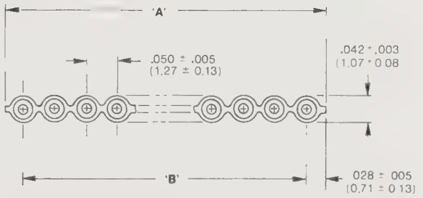
Conductors: 28 AWG, 7/36 strand, tinned copper
Number of conductors: 10, 14, 16, 20, 24, 25, 26, 34, 36, 37, 40, 50, 60 and 64
Color code: Brown, red, orange, yellow, green, blue, violet, gray, white, black (repeat)
Conductor spacing: .050″ ± .005″
Cable thickness: .042″ ± .003″
Laminate: Clear PVC, self-extinguishing

Electrical

Voltage rating: 300 V
Current rating: 1 amp nominal at 10°C above ambient
Temperature rating: 80°C standard 105°C consult factory
Impedance: 105 ohms nominal
Capacitance: 13.0 pf/ft. (42,7 pf/m) nominal @ 1MHz
Crosstalk: 10′ sample, 5 ns rise time with 2 lines driven. NE = 4.7% FE = 4.3% nominal
Propagation delay: 1.5 ns/ft. (4.9 ns/m) nominal.
Insulation resistance: 10^{10} ohms — 10 ft. (3 m) min.
UL style number: Component wire style 1061. Cable style 2697 (80°C) standard. For Cable style 20130 (105°C) consult factory.
CSA: Cable may be certified under Canadian Standards Association (CSA) Applicance Wiring Material Program (Specify at time of order).
CSA AWM I A80°C, 300 V, FT-1.

other cables in series

Conductors: 12 through 30 AWG solid, stranded, tinned overcoat, top coated, tinned, bare
Conductor spacing: .050″, .085″, .100″, .125″, .156″



28 AWG SHOWN

Other Capabilities

Part Number	AWG-Strand	Center line
843-135-2610-XXX	26-7/34	.050″
843-135-2601-XXX	26-7/34	.085″
843-135-2401-XXX	24-7/32	.085″
843-135-2602-XXX	26-7/34	.100″
843-135-2402-XXX	24-7/32	.100″
843-135-2603-XXX	26-7/34	.125″
843-135-2604-XXX	26-7/34	.156″
843-135-2403-XXX	24-7/32	.156″
843-136-2201-XXX	22-7/30	.156″

*843-136-XXXX-XXX use a 10 mil film.

order information

Series 843-135-2801 28 AWG, 7/36 .050″ centers

Part Number	No. Cond.	Width 'A'		Span 'B'	
		Inches	(mm)	Inches	(mm)
843-135-2801-010	10	.505	(12,83)	.450±.015	(11,43±0,38)
843-135-2801-014	14	.705	(17,91)	.650±.015	(16,51±0,38)
843-135-2801-016	16	.805	(20,45)	.750±.015	(19,05±0,38)
843-135-2801-020	20	1.005	(25,53)	.950±.015	(24,13±0,38)
843-135-2801-024	24	1.205	(30,61)	1.150±.015	(29,21±0,38)
843-135-2801-025	25	1.255	(31,88)	1.200±.015	(30,48±0,38)
843-135-2801-026	26	1.305	(33,15)	1.250±.015	(31,75±0,38)
843-135-2801-034	34	1.705	(43,31)	1.650±.015	(41,91±0,38)
843-135-2801-036	36	1.805	(45,85)	1.750±.015	(44,45±0,38)
843-135-2801-037	37	1.855	(47,12)	1.800±.015	(45,72 ± 0,38)
843-135-2801-040	40	2.005	(50,93)	1.950±.020	(49,53±0,51)
843-135-2801-050	50	2.505	(63,63)	2.450±.020	(62,23±0,51)
843-135-2801-060	60	3.005	(76,33)	2.950±.020	(74,93 ± 0,51)
843-135-2801-064	64	3.205	(81,41)	3.205±.020	(80,01±0,51)

Jacketed Zip planar cable — 151 series

description

Spectra-Strip Zip extruded jacketed cables combine the ease of termination, consistent electrical characteristics and reduced space requirements of flat cable with the ruggedness of an extruded protective outer jacket — Spectra-Guard®.

It is available with or without integral EMI/RFI shielding. Spectra-Guard provides excellent abrasion resistance, extremely low crosstalk (see test data), consistent electrical characteristics, and high flexibility, making it ideal for high-speed data processing equipment and high frequency communications systems.

Basic component cable consists of 28 (7X36) uninsulated conductors on .050″ centers with an extruded PVC insulation. Both the jacket and cable are made of flame-retardant PVC and are UL listed to 105°C (221°F) and 150 volts. Terminates to standard connectors.

We can also provide fully-tested terminated assemblies. For more information, please consult the factory.

benefits

- Rugged, flexible protection
- Excellent crosstalk and electrical performance
- Available with or without EMI/RFI shielding
- Terminates to standard IDC connectors
- UL CL2 and CSA

characteristics

Physical

Conductors: 28 AWG, 7/36 strands, tinned copper

Conductors insulation: Gray PVC, flame retardant

Conductor spacing: .050″ (1,27) typical

Shielding (if applicable): Aluminum/ poly or expanded copper mesh

Drain wires (if applicable): 28 AWG, 7/36 strand, tinned copper

Jacket: Black PVC, 30 mil avg. Consult factory for other available thicknesses

Electrical

Voltage rating: 300V

Temperature rating: 105°C, (221°F), UL Listed Power Limited Circuit Cable CL2

CSA: CSA AWM I/II A105°C (221°F), 300 V, FT-1

151 series capabilities

843-151-2811-XXX Zip cable, jacketed with no shield, no drain wires

843-151-2831-XXX Zip cable, jacketed, shielded with aluminum poly, two drain wires

843-151-2821-XXX Zip cable, jacketed, shielded with expanded copper mesh

Part Number	Wire Gauge Strand	Description	Temp. Rating	Voltage Rating	Impedance Ohms*	1MHz Capacitance pf/ft (pf/m)*	Propagation Delay ns/ft (ns/m)	Insulation Resistance ohms	UL Style
843-151-2811-XXX	28(7/36)	Extruded PVC jacket	105°C	300V	90	30 (89)	1.6 (5,6)	10^{10} – 10 ft.	2912 20081
843-151-2831-XXX	28(7/36)	Aluminum/ poly shield 2 drain wires with extruded PVC jacket	105°C	300V	50	40 (131)	1.6 (5,2)	10^{10} – 10 ft.	2912 20081

*Shield floating (GSG)
*G-S-G/Shield Grounded

Jacketed Zip planar cable — 151 series

order information

Part No. & Description	Part No. & Description				
Extruded PVC Jacket	Aluminum/Poly Shield with Extruded PVC Jacket (2 drain wires)	No. of Conductors	Dimension "A"	Dimension "B"	Dimension "C"
843-151-2811-009	843-151-2831-009	9	.450(11,43)	.400±.007(10,16±0,18)	.510
843-151-2811-010	843-151-2831-010	10	.500(12,70)	.450±.007(11,43±0,18)	.560
843-151-2811-014	843-151-2831-014	14	.700(17,78)	.650±.007(16,51±0,18)	.760
843-151-2811-015	843-151-2831-015	15	.750(19,09)	.700±.011(17,78±0,28)	.810
843-151-2811-016	843-151-2831-016	16	.800(20,32)	.750±.011(20,32±0,28)	.860
843-151-2811-020	843-151-2831-020	20	1.000(25,40)	.950 ± .011(24,13 ±0,28)	1.060
843-151-2811-024	843-151-2831-024	24	1.200(30,48)	1.150±.011(29,21±0,28)	1.260
843-151-2811-025	843-151-2831-025	25	1.250(31,79)	1.200±.011(30,48±0,28)	1.310
843-151-2811-026	843-151-2831-026	26	1.300(33,02)	1.250±.011(31,75±0,28)	1.360
843-151-2811-034	843-151-2831-034	34	1.700(43,18)	1.650±.011(41,90±0,28)	1.760
843-151-2811-036	843-151-2831-036	36	1.800(45,72)	1.750±.015(44,45±0,38)	1.860
843-151-2811-037	843-151-2831-037	37	1.850(46,99)	1.800±.015(45,72±0,38)	1.910
843-151-2811-040	843-151-2831-040	40	2.000(50,80)	1.950±.015(49,53±0,38)	2.060
843-151-2811-050	843-151-2831-050	50	2.500(63,50)	2.450±.015(62,23±0,38)	2.560
843-151-2811-060	843-151-2831-060	60	2.000(76,20)	2.950±.015(74,93±0,38)	3.060
843-151-2811-064	843-151-2831-064	64	3.200(81,28)	3.150±.015(80,01±0,38)	3.260

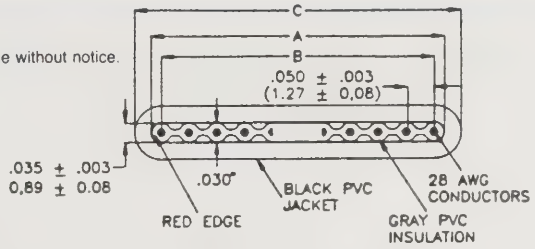
typical crosstalk characteristics

(10-foot sample, 2-lines driven)

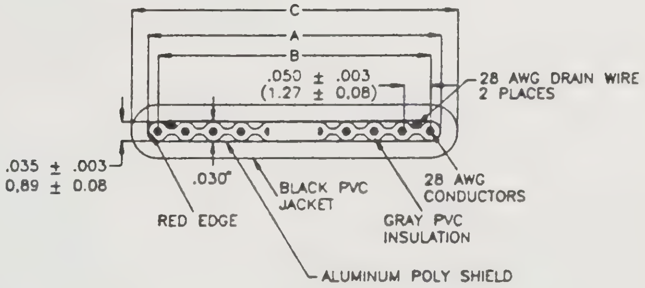
Part Number	Rise Time (ns)	NE %	FE %
843-151-2811 Series	3.0 5.0 7.0	4.4 4.3 4.3	1.2 .8 .6
843-151-2831 Series	3.0 5.0 7.0	.3 .2 .2	.7 .5 .4

Dimensions and characteristics subject to change without notice.

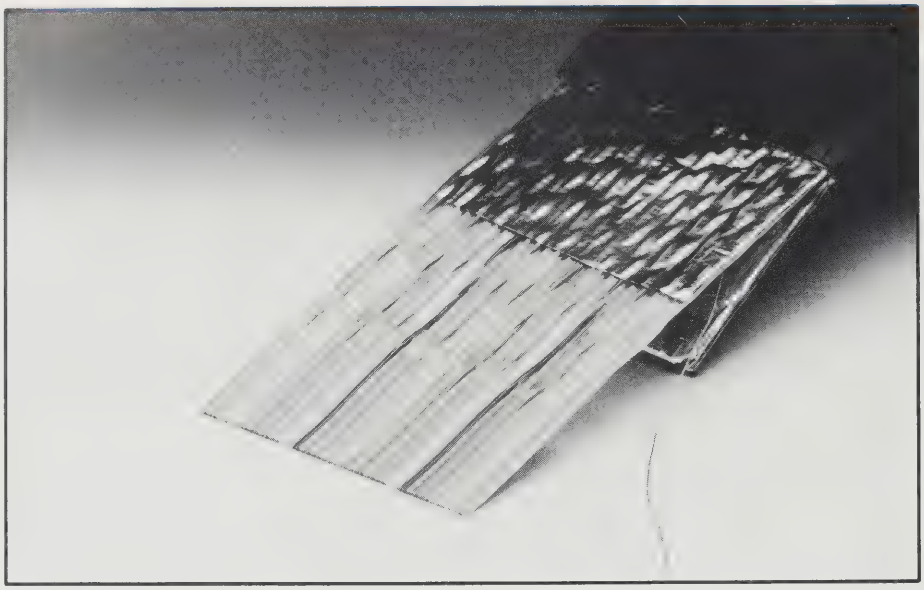
843-151-2811 SERIES UNSHIELDED



843-151-2831 SERIES SHIELDED



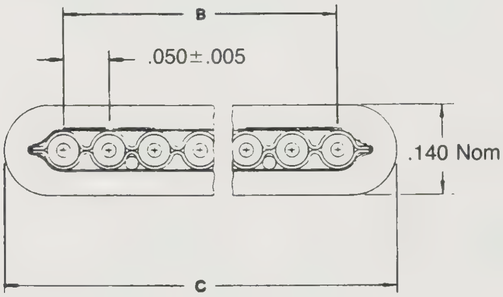
Twist 'N' Flat® jacketed cable with aluminum/mylar shield — 152 series



description

With all the labor saving benefits of Twist 'N' Flat, which combines the electrical characteristics of twisted pairs with alternating flat sections for quick and easy mass termination, the addition of shielding and jacketing helps comply with the tough EMI/RFI standards of the FCC.

Jacketed Twist 'N' Flat cable is available in its standard off-the-rack configuration — 2″ flat section alternating with an 18″ twisted pairs section. It can also be custom-tailored to fit your exact application needs, with flat sections longer than 3″ and twisted pairs sections up to 100 feet long.



order information

Series 152-2831-0XX

P/N	Cond	C	B	Inner Cable
843-152-2831-010	10	0.590 nom	0.450±.015	132-2801-010
843-152-2831-014	14	0.790 nom	0.650±.015	132-2801-014
843-152-2831-016	16	0.890 nom	0.750±.015	132-2801-016
843-152-2831-020	20	1.090 nom	0.950±.015	132-2801-020
843-152-2831-026	26	1.390 nom	1.250±.015	132-2801-026
843-152-2831-034	34	1.790 nom	1.650±.015	132-2801-034
843-152-2831-040	40	2.090 nom	1.950±.020	132-2801-040
843-152-2831-050	50	2.590 nom	2.450±.020	132-2801-050
843-152-2831-060	60	3.090 nom	2.950±.020	132-2801-060

benefits

- Labor and cost savings
- Twisted-pair electrical characteristics
- Quick and easy mass termination
- EMI/RFI shielding
- Spectra-Guard® extruded jacket
- UL CL2 and CSA

characteristics

Inner Cable (Twist 'N' Flat)

Conductor: 28-7/36, tinned copper
Insulation: Extruded PVC, .010 nominal wall
Laminate: .005 clear PVC (2) layers
Temperature: 80°C, (105°C available upon request)
Voltage: 300V
UL Style: 2697
CSA Certified

Jacket (Spectra-Guard)

Insulation: Extruded black PVC, .030 min. avg. wall
Shield: Aluminum/poly
Drains: 28-7/36, tinned copper
Temperature: 80°C (105°C available upon request)
Voltage: 300V
UL Listed Power Limited Circuit Cable CL2
CSA AWM I/II A80° 300 V, FT-1.

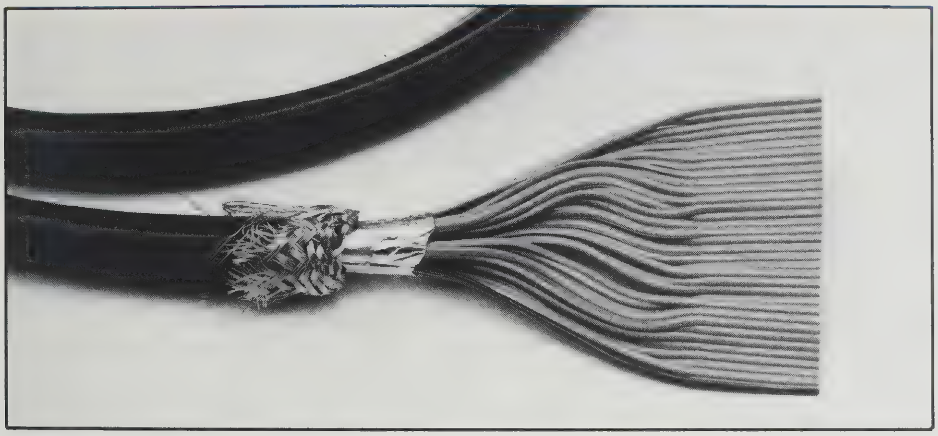
Test Data (10-foot sample)

Capacitance: 22 pf/ft. (S-G/Shield configuration 1 MHz)
Impedence: 65 ohm (S-G/Shield configuation)
Propagation Delay: 1.6 nsec./ft.

152 series capabilities

843-152-2811-XXX Twist 'N' Flat, jacketed, no shield, no drain wires
843-152-2831-XXX Twist 'N' Flat, jacketed, aluminum/poly shielded, two drain wires
843-152-2821-XXX Twist 'N' Flat, jacketed, copper mesh shield

Spectra-Strip® Round ‘N’ Flat™ jacketed shielded cable — 159-2801 series



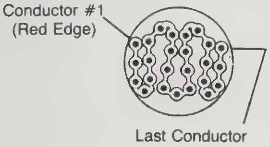
description

Round ‘N’ Flat cable combines, into a single construction, the handling and shielding features of round cable and the mass termination capabilities of flat cable. This product is designed for routing in tight spaces where a round shape is more practical and where a foil /braid shield is necessary to help meet FCC requirements for EMI/RFI suppression.

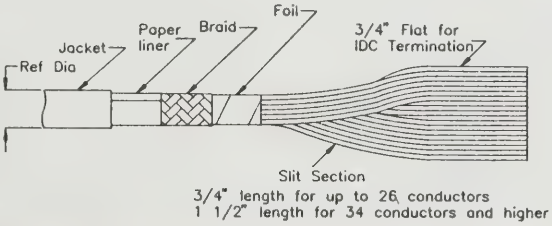
The inner cable is extruded Spectra-Zip with alternating sections that are flat and slitted. Each flat section is ¾″ in length with conductors on controlled spacing of .050″±.003″ making it ideally suited for IDC mass termination methods. The alternating flat and slit sections also offer an advantage over standard round cable for hand terminations. The flat sections keep the conductors aligned for conductor positioning while the slit zip feature provides easy breakout of individual conductors.

One edge of the flat cable is marked for conductor referencing. Two layers of shielding, aluminum-polyester foil and tinned copper braid, are used to protect signals from EMI interference.

INNER CABLE



COMPOSITE


Foil
Paper liner
Braid
Jacket
Ref Dia
3/4" Flat for IDC Termination
Slit Section
3/4" length for up to 26 conductors
1 1/2" length for 34 conductors and higher

order information

Series 159-2801-0XX AWG 28 — 7/36, .050″ centers

Part Number	No. Cond.	Width ‘A’		Span ‘B’		Ref. Dia. Inches
		Inches	(mm)	Inches	(mm)	
843-159-2801-009	9	.450	(11,43)	.400±.007	(10,16±0,18)	.270
843-159-2801-010	10	.500	(12,70)	.450±.007	(11,43±0,18)	.270
843-159-2801-015	15	.750	(19,05)	.700±.011	(17,78±0,28)	.300
843-159-2801-016	16	.800	(20,32)	.750±.011	(19,05±0,28)	.310
843-159-2801-020	20	1.000	(25,40)	.950±.011	(24,13±0,28)	.330
843-159-2801-024	24	1.200	(30,48)	1.150±.011	(29,21±0,28)	.350
843-159-2801-025	25	1.250	(31,75)	1.200±.011	(30,48±0,28)	.360
843-159-2801-026	26	1.300	(33,02)	1.250±.011	(31,75±0,28)	.360
843-159-2801-034	34	1.700	(43,18)	1.650±.011	(41,91±0,28)	.400
843-159-2801-036	36	1.800	(45,72)	1.750±.015	(44,45±0,38)	.410
843-159-2801-037	37	1.850	(47,00)	1.800±.015	(45,72±0,38)	.410
843-159-2801-040	40	2.000	(50,80)	1.950±.015	(49,53±0,38)	.430
843-159-2801-050	50	2.500	(63,50)	2.450±.015	(62,23±0,38)	.480
843-159-2801-060	60	3.000	(76,20)	2.950±.015	(74,93±0,38)	.520
843-159-2801-064	64	3.200	(81,28)	3.150±.015	(80,01±0,38)	.530

Standard put-up is 100 feet on cardboard reels. Consult factory for larger put-ups.

benefits

- Round cable that mass terminates
- High flexibility
- Helps meet FCC regulations
- UL, CL2
- CSA Certified

characteristics

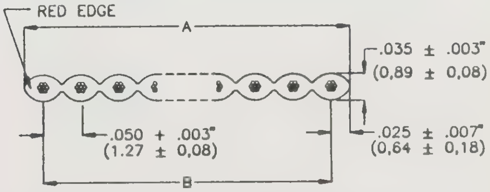
Physical

Conductors: 28 AWG, 7/36 tinned copper
Color code: gray with red edge
Insulation: PVC, .010″ wall
Thickness: .035″+.003″
Pitch: .050″+.003″
Shielding: Aluminum/polyester tape, with minimum 85% coverage tinned copper braid
Jacket: Black PVC, .030″ nom. wall
Liner: Paper liner between jacket and braid
Temperature rating -20° to 105°C (-4° to +221°F)
UL style: Inner cable: 2651; composite: UL Listed Power Limited Circuit Cable CL2 CSA AWM I/II A105°C 300 V, FT-1

Electrical

Voltage: 300 volts
*Impedance: 75 ohms
*Capacitance: 24 pf/ft. at 1 MHz (78.7 pf/m)
*Inductance: .15 μh/ft at 1 MHz (.49 μh/m)
Propagation delay: 1.60 ns/ft. (5.25 ns/m)
Insulation resistance: 10^{10} ohms — 10 ft., min.

*Above values measured in the ground-signal-ground mode with the shield also grounded.



159 series capabilities

159-2801-0XX Round ‘N’ Flat, aluminum/poly shield, tinned copper braid
159-2801-1XX Round ‘N’ Flat, aluminum/poly shield only, no braid
159-2801-2XX Round ‘N’ Flat, no shield, clear poly only
Reference diameters for -1XX and -2XX are .030″ to .040″ smaller than above.
Standard put-up is 100 feet on cardboard reels. Consult factory for larger put-ups.

Spectra-Strip®
Round Twist 'N' Flat™
jacketed shielded cable — 159-2832 series

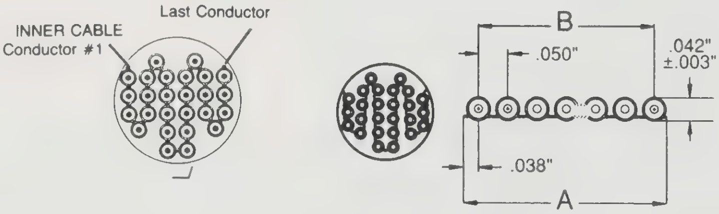
description

Round Twist 'N' Flat cable combines into a single construction, the handling and shielding features of round cable and the mass termination capabilities of flat cable. This product is designed for routing in tight spaces where a round shape is more practical and where a foil/braid shield is necessary to help meet FCC requirements for EMI/RFI suppression.

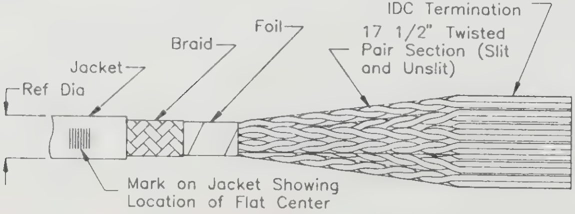
The inner cable is composed of twisted pairs with alternating flat sections. Each flat section is 2½″ in length with conductors on controlled spacing of .050″ ± .005″, making it ideally suited for IDC mass termination methods. The twist portion has alternating slit and unslit sections, which also offers an advantage over standard round cable for hand terminations. The unslit sections keep the pairs aligned for conductor positioning, while the slit feature provides easy breakout of individual conductors.

The standard product is color coded with a tan common in each pair. Two layers of shielding—aluminum-polyester foil and tinned copper braid—are used to protect signals from EMI interference. This product can also be designed with shielding reduced or eliminated.

dimensions



COMPOSITE


2 1/2" Flat for IDC Termination
17 1/2" Twisted Pair Section (Slit and Unslit)
Foil
Braid
Jacket
Ref Dia
Mark on Jacket Showing Location of Flat Center

benefits

- Round cable that mass terminates
- High flexibility
- Twisted pair electrical characteristics
- Helps meet FCC regulations
- UL CL2 and CSA

characteristics

Physical

Conductors: 28 AWG-7/36 tinned copper

Color code: Brown, red, orange, yellow, green, blue, violet, gray, white, black and repeat with tan common

Insulation: PVC, .010″ wall laminated between .005″ clear PVC film

Thickness: .042″ ± .003″

Pitch: .050″ ± .005″

Twist length: 17.5 inches (consult factory for other available lengths)

Flat length: 2.5 inches

Shielding: Aluminum/polyester foil, with minimum 85% coverage tinned copper braid

Temperature rating: −20° to +105°C (−4° to +221°F)

UL style: Inner cable: 20130; composite: UL Listed Power Limited Circuit Cable CL2
CSA AWM I/II A105°C 300 V, FT-1

Electrical

Voltage: 300 volts

*Impedance: 70 ohms

*Capacitance: 25 pf/ft at 1MHz (82.0 pf/m)

*Inductance: .21 uh/ft at 1 MHz (.69 uh/m)

Propagation delay: 1.65 ns/ft (5.58 ns/m)

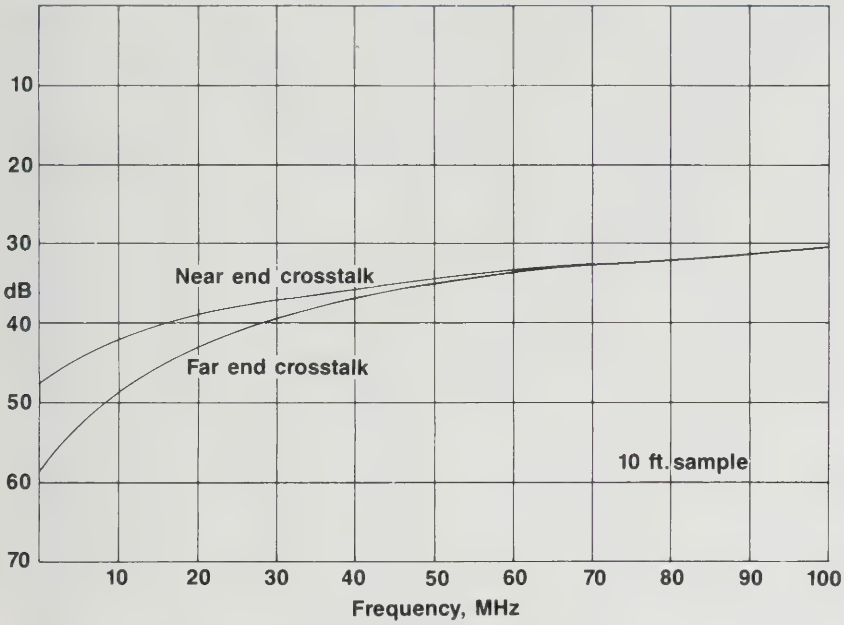
Insulation resistance: 10^{10} ohms-10 ft, min.

Crosstalk: Unbalanced: NE 2.3% FE 1.3% 10 ft sample, 5ns risetime, 2 lines driven; Balanced: see chart

*Above values measured in the ground-signal mode with the shield also grounded

Spectra-Strip® Round Twist 'N' Flat™ jacketed shielded cable — 159-2832 series

balanced crosstalk



order information

Series 843-159-2832-0XX 28 AWG—7/36, .050″ centers

Part Number	No. Pairs	Width 'A'		Span 'B'		Ref. Dia. Inches
		Inches	(mm)	Inches	(mm)	
843-159-2832-010	5	.526	(13,36)	.450	11,43	.300
843-159-2832-014	7	.726	(18,44)	.650	16,51	.330
843-159-2832-016	8	.826	(20,98)	.750	19,05	.340
843-159-2832-020	10	1.026	(26,06)	.950	24,13	.380
843-159-2832-026	13	1.326	(33,68)	1.250	31,75	.410
843-159-2832-034	17	1.726	(43,84)	1.650	41,91	.450
843-159-2832-040	20	2.026	(51,46)	1.950	49,53	.480
843-159-2832-050	25	2.526	(64,16)	2.450	62,23	.530
843-159-2832-060	30	3.026	(76,86)	2.950	74,93	.570
843-159-2832-064	32	3.226	(81,94)	3.150	80,01	.580

159 series capabilities

843-159-2832-0XX Round Twist 'N' Flat, aluminum/poly shield, tinned copper braid
843-159-2832-1XX Round Twist 'N' Flat, aluminum/poly shield only, no braid
843-159-2832-2XX Round Twist 'N' Flat, no shield, clear poly only

Reference diameters for -1XX and -2XX are .030″ to .040″ smaller than above. Standard put-up is 100 feet on cardboard reels. Longer lengths are available upon request.

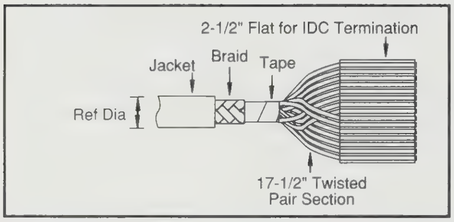
Loose Pair Round Twist 'N' Flat® Cable
169-2832 Series

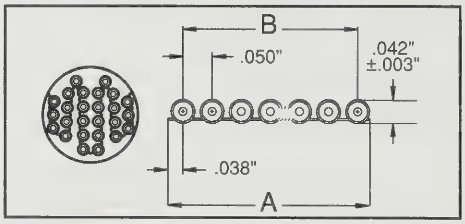
description

Loose Pair Round Twist 'N' Flat® cable is designed to combine the electrical performance and handling features of discrete twisted pair cable with the mass termination capabilities of flat ribbon cable.

The inner cable consists of 28-7 AWG tinned copper conductors insulated with PVC and twisted into loose pairs. Conductors are laminated in parallel on .050" conductor spacing every 20 inches to accept termination to insulation displacement connectors. Laminated .050" areas can be fabricated at custom intervals. Minimum twist length is 6", maximum twist length determined by size of put up.

The loose twisted pairs are wrapped in aluminum polyester foil shield and overall tinned copper braid shield to help meet FCC requirements for EMI/RFI suppression. A round .030" PVC jacket is extruded over the cable for maximum protection and ease of routing. The center of each laminated .050" area is visible on the outer jacket to locate connector terminating areas quickly and easily.





cable selection chart

PART NUMBER	NO. PAIRS	WIDTH 'A' INCHES	WIDTH 'A' (MM)	SPAN "B" INCHES	SPAN "B" (MM)	REF DIA (Inches) N = 0	REF DIA (Inches) N = 1, 2
169-2832-N10	5	.526	(13,36)	.450	(11,43)	.250	.220
169-2832-N14	7	.726	(18,44)	.650	(16,51)	.260	.230
169-2832-N16	8	.826	(20,98)	.750	(19,05)	.280	.250
169-2832-N20	10	1.026	(26,06)	.950	(24,13)	.290	.260
169-2832-N26	13	1.326	(33,68)	1.250	(31,75)	.310	.280
169-2832-N34	17	1.726	(43,84)	1.650	(41,91)	.360	.330
169-2832-N40	20	2.026	(51,46)	1.950	(49,53)	.390	.360
169-2832-N50	25	2.526	(64,16)	2.450	(62,23)	.430	.400
169-2832-N60	30	3.026	(76,86)	2.950	(74,93)	.470	.440
169-2832-N64	32	3.226	(81,94)	3.150	(80,01)	.480	.450

N = Shielding Variations 0 = Foil/Braid 1 = Foil Only 2 = No Shield, Jacket Only

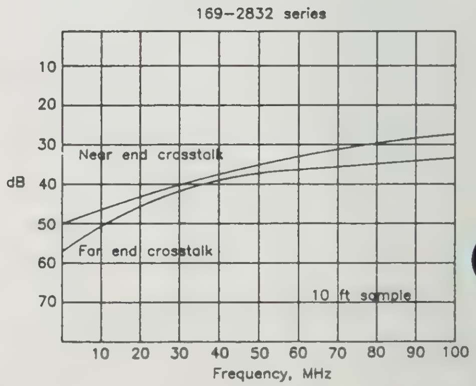
characteristics

Physical

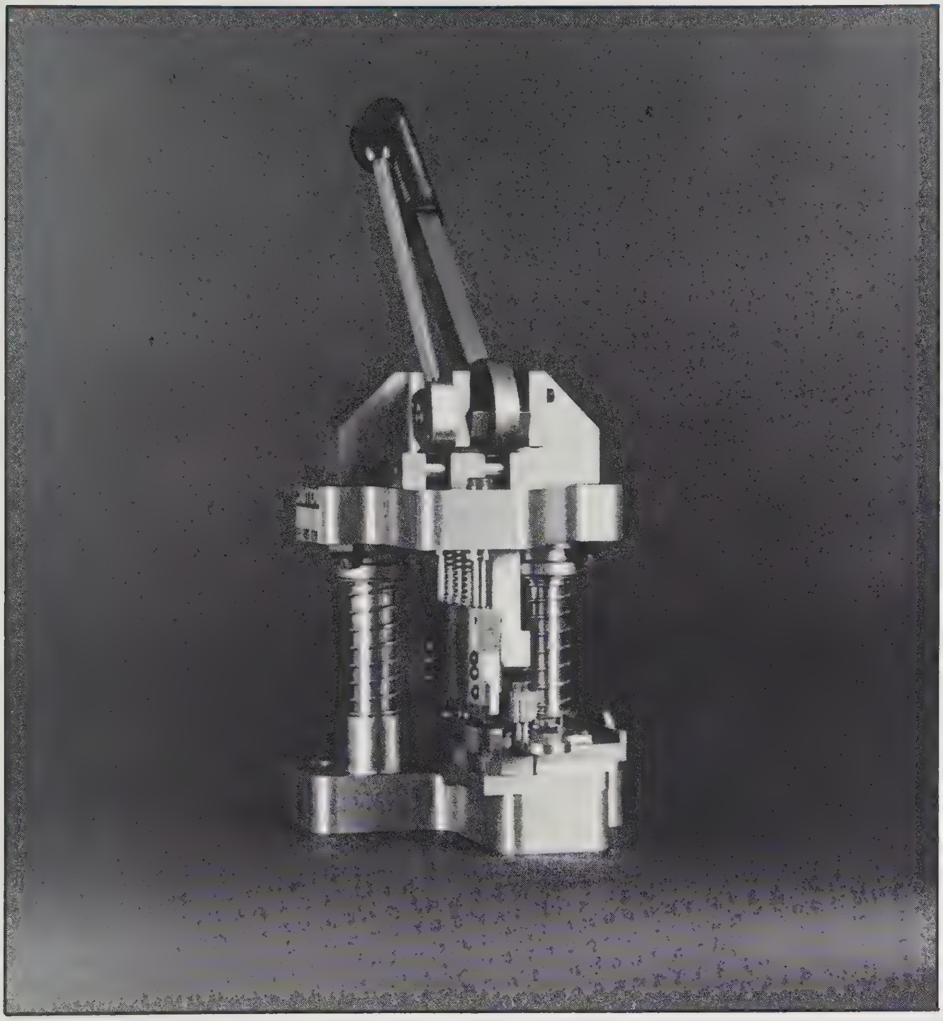
Conductors: 28-7/36 AWG Tinned Copper
Insulation: Extruded .010" PVC wall (laminated between .005" clear PVC films at flat sections)
Flat Pitch: .050"
Shielding: Aluminum/Polyester foil, with minimum 85% coverage tinned copper braid
Jacket: Black PVC, .030" Wall
Temperature Rating: -20 to +105°C (-4 to 221°F)
Approvals:
169-2832-0XX
Inner cable - UL Recognized AWM 20130
Composite - UL CL2 CSA AWM I/II A105°C 300V, FT-1
UL Listed Type CL2 CSA Certified
Color Code: Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White, Black and Repeat with Tan Common.

Electrical

Voltage: 300 Volts
Impedance: 70 ohms
Capacitance: 25 pf/ft at 1 MHz (82.0 pf/m)
Inductance: .13 uh/ft at 1 MHz (.43 uh/m)
Propagation Delay: 1.70 ns/ft (5.58 ns/m)
Insulation Resistance: 10^{10} ohms - 10 ft. min
Note: Above values measured in the ground-signal mode with the shield also grounded.
CrossTalk:
Balanced - See chart below
Unbalanced - 10 ft sample, 5ns Risetime
2 Lines Driven
Near End - 2.3%
Far End - 1.3%



Spectra-Strip® Round 'N' Flat™ termination press — 324-0420 series



benefits

- Holds 159/169 series Round'N'Flat and Round Twist'N'Flat cable securely in posistion for ease of termination
- Cuts cable end square for proper connector alignment
- Quickly terminates up to 64 conductors without prestripping
- Makes daisy-chain interconnections
- Allows visual inspection of termination
- Rugged, lightweight and portable

description

Specifically designed for **159 series Round 'N' Flat and Round Twist 'N' Flat cable**, this termination press is available as a complete system. All tools necessary for adjustment or change of connector series base plates are included. Base plates for each connector series will accommodate all available sizes of that series connector housings.

order information

Termination press with 812 series socket connector base plate, 1/8″ and 5/32″ allen wrenches — P/N 324-0420-001

other available connector base plates:

812 series socket connector — P/N 324-0021-003
817 series D-sub connector — P/N 324-0021-008
841 series D-sub connector — P/N 324-0021-009
850 series Micro-ribbon 57F — P/N 324-0021-010

Note: D-sub series connectors require a special anvil (P/N 324-0021-902) for some termination procedures. Consult Spectra-Strip® Cable Operations at 1-800-846-6400 for additional information.

Spectra-Strip® Round 'N' Flat™ termination press — 324-0420 series

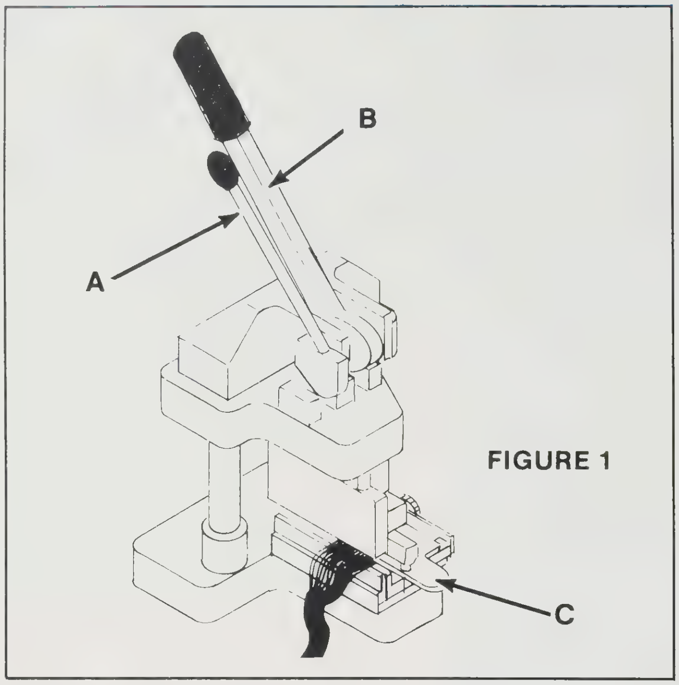


FIGURE 1

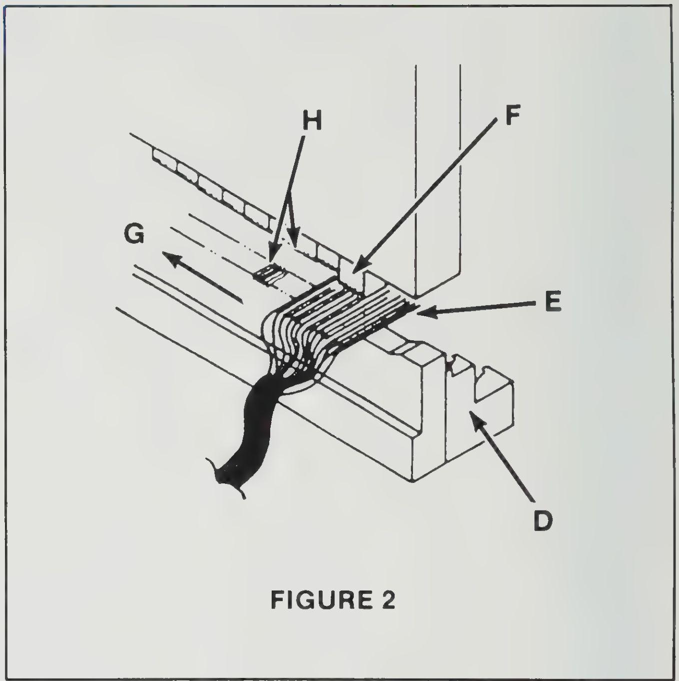


FIGURE 2

preliminary set-up

- Install required connector base (D) with two screws.
- Adjust cutter asembly (C) to base.
- Prepare cable.

termination procedure

- Place flattened cable through cable hold area (E).
- Pull handle (A) forward to engage first five conductors (F).
- Pull remaining conductors toward back of press (G).
- Pull handle (A) remaining distance forward to lock cable in place, one conductor per groove (H).
- Cable is locked in position.
- Pull handle (B) forward to trim end of cable.
- Move cutter assembly (C) away from connector base.
- Place connector on connector base and between cable end.
- Pull handle (B) forward to close connector.
- Termination is complete, release both handles.

daisy chain termination

- Daisy chains can be terminated using the same procedure described above.
- The only change required is to swing the cutting assembly (C) out of the termination area.

Spectra-Zip® planar cable
191-2601 series

description

Spectra-Zip cable consists of 26 AWG stranded round conductors insulated with gray PVC on .050" centers to form a planar cable. This cable is designed for mass termination IDC type connectors. A tear feature built into the cable allows easy, uniform breakouts without rupturing the insulation.

Spectra-Zip planar cable offers a balanced combination of economy, reliable performance, weight and space savings, controlled electrical characteristics, and low-cost termination for general-purpose interconnection in electronic products from calculators and automobiles to computers and switching networks.

benefits

- Economical with reliable performance.
- Cost-effective IDC termination.
- Tear feature allows easy, uniform breakouts without rupturing the insulation.

characteristics

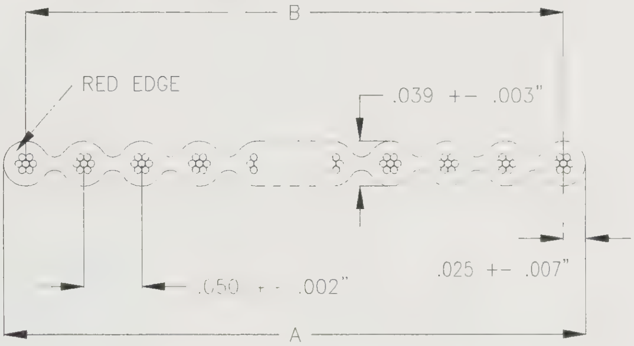
Physical

Conductors: 26 AWG 7/34 strand, tinned copper
Insulation: Extruded PVC, .010" wall
Color: Gray, one edge red
Conductor Spacing: .050 ±.002"
Cable Thickness: .039 ±.003"
Temperature Rating: -20° to 105° C (-4° to 22°F)

Electrical

Voltage Rating: 300 volts per UL style
Current Rating: 1.5 amps nominal at 10° rise above ambient.
Impedance: 92 ohms
Capacitance: 16.5 pf/ft @ 1.0 MHz
Inductance: .15 µH/ft @ 1.0 MHz
Propagation Delay: 1.5 ns/ft
Insulation Resistance: 10^{10} ohms - 10 ft., min
Cross Talk: 10 ft sample, 5 ns rise time, 2 lines driven, near end- 3.5% max; far-end 5.0% max

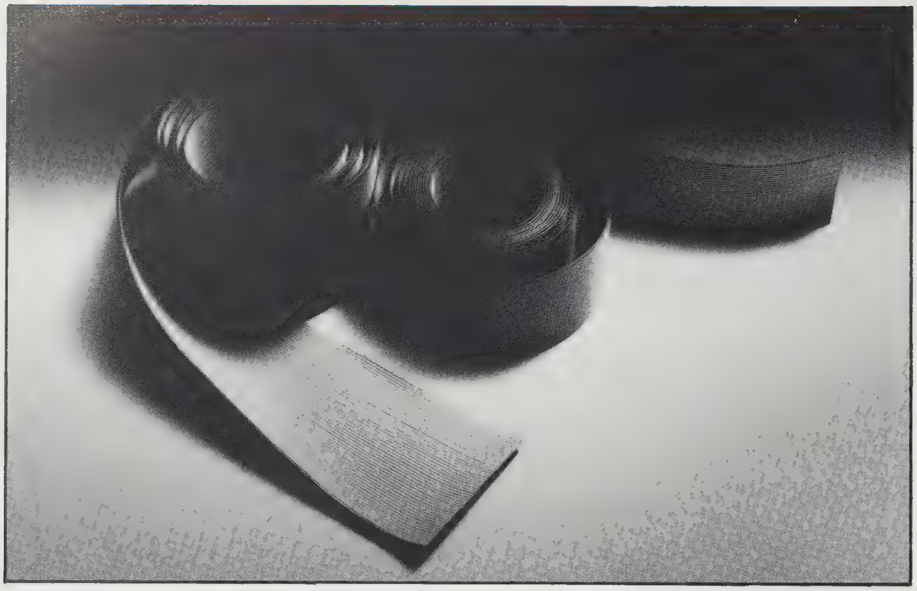
UL Style #2651, meets VW-1 CSA AWM FT-1



PART #	# COND	WIDTH A (nominal)		SPAN B	
		INCHES	(mm)	INCHES	(mm)
191-2601-110	10	0.500	(12,70)	0.450 ±.007	(11,43 ±0,18)
191-2601-114	14	0.700	(17,78)	0.650 ±.007	(16,51 ±0,18)
191-2601-116	16	0.800	(20,32)	0.750 ±.011	(19,05 ±0,28)
191-2601-120	20	1.000	(25,40)	0.950 ±.011	(24,13 ±0,28)
191-2601-125	25	1.250	(31,75)	1.200 ±.011	(30,48 ±0,28)
191-2601-126	26	1.300	(33,02)	1.250 ±.011	(31,75 ±0,28)
191-2601-134	34	1.700	(43,18)	1.650 ±.011	(41,91 ±0,28)
191-2601-137	37	1.850	(46,99)	1.800 ±.015	(45,72 ±0,38)
191-2601-140	40	2.000	(50,80)	1.950 ±.015	(49,53 ±0,38)
***191-2601-150**	**50**	**2.500**	**(63,50)**	**2.450 ±.015**	**(62,23 ±0,38)**
191-2601-160	60	3.000	(76,20)	2.950±.015	(74,93 ±0,38)
191-2601-164	64	3.200	(81,28)	3.150 ±.015	(80,01 ±0,38)

Used for Fast 20 SCSI, 8 bit narrow applications

Spectra-Zip® planar cable — 191-2801 series



description

Spectra-Zip planar cable offers a balanced combination of economy, reliable performance, weight and space savings, controlled electrical characteristics, and low-cost termination for general-purpose interconnection in electronic products from calculators and automobiles to computers and switching networks.

Spectra-Zip cable consists of stranded round conductors insulated with gray PVC to form a planar cable. The insulation is extruded around the conductors so that the cable has a "double contour" to allow for mounting IDC connectors on either surface of the cable. A tear feature built into the cable allows easy, uniform breakouts without rupturing the insulation. Spectra-Zip cable is packaged in 100-foot putups in dispenser boxes.

For other wire gauges, spacing materials and lengths, please consult the Spectra-Strip sales office nearest you.

order information

Series 843-191-2801-XXX

Part Number	No. Cond.	Width 'A'		Span "B"	
		Inch	(mm)	Inch	(mm)
843-191-2801-109	9	.450	(11,43)	.400 ± .007	(11,43 ± 0,18)
843-191-2801-110	10	.500	(12,70)	.450 ± .007	(11,43 ± 0,18)
843-191-2801-114	14	.700	(17,78)	.650 ± .007	(16,51 ± 0,18)
843-191-2801-115	15	.750	(19,05)	.700 ± .007	(17,78 ± 0,18)
843-191-2801-116	16	.800	(20,32)	.750 ± .011	(19,05 ± 0,28)
843-191-2801-120	20	1.000	(25,40)	.950 ± .011	(24,13 ± 0,28)
843-191-2801-124	24	1.200	(30,48)	1.150 ± .011	(29,21 ± 0,28)
843-191-2801-125	25	1.250	(31,75)	1.200 ± .011	(30,48 ± 0,28)
843-191-2801-126	26	1.300	(33,02)	1.250 ± .011	(31,75 ± 0,28)
843-191-2801-134	34	1.700	(43,18)	1.650 ± .011	(41,91 ± 0,28)
843-191-2801-136	36	1.800	(45,72)	1.750 ± .015	(44,45 ± 0,38)
843-191-2801-137	37	1.850	(47,00)	1.800 ± .015	(45,72 ± 0,38)
843-191-2801-140	40	2.000	(50,80)	1.950 ± .015	(49,53 ± 0,38)
843-191-2801-150	50	2.500	(63,50)	2.450 ± .015	(62,23 ± 0,38)
843-191-2801-160	60	3.000	(76,20)	2.950 ± .015	(74,93 ± 0,38)
843-191-2801-164	64	3.200	(81,28)	3.150 ± .015	(80,01 ± 0,38)

843-191-2801-0XX UL Now Supplied As 1XX UL/CSA 3XX = 300′ Rolls

benefits

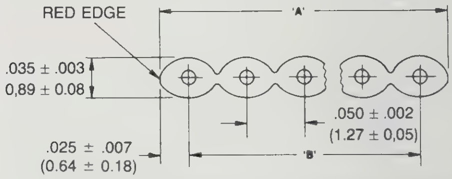
- Fast, low-cost mass termination.
- Precise spacing for controlled electrical characteristics.
- Flexible gray PVC insulation.
- Double contour allows termination from either side of cable.
- Easy conductor separation for circuit routing.
- UL recognized and CSA certified.

Physical

Conductors: 28 AWG, 7/36 strand tinned copper
Number of conductors: 10, 14, 16, 20, 24, 25, 26, 34, 36, 37, 40, 50, 60 and 64
Color: Gray (one edge red)
Conductor spacing: .050″ ± .002″
Cable thickness: .035″ ± .003″
Insulation: Gray PVC, flame retardant VW-1

Electrical

Voltage rating: 300 V
Current rating: 1 amp nominal at 10°C above ambient
Temperature rating: 105°C, (221°F)
Impedance: 105 ohms nominal
Capacitance: 14 pf/ft. (45,9) pf/m) nominal @ 1 MHz
Crosstalk: 10′ sample 5 ns rise time with 2 lines driven
NE = 3.0%, FE = 4.0% nominal
Propagation delay: 1.5 ns/ft. (4,9 ns/m) nominal
Insulation resistance: 10^{10} ohms — 10 ft. min.
UL style number: Cable style 2651
CSA: CSA AWM I A105° (221°F), 300 V, FT-1.

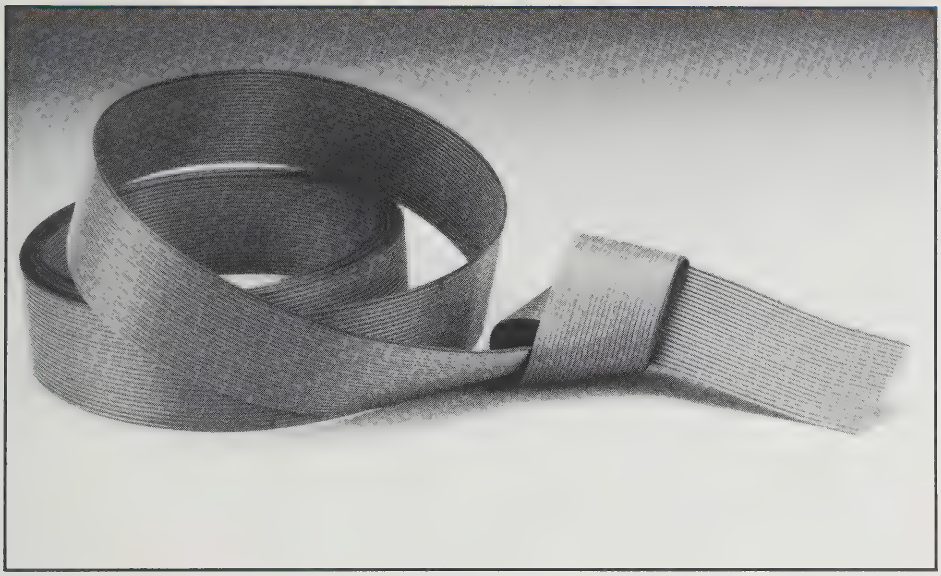


Dimensions and characteristics subject to change without notice.

other cable capabilities

Part Number	AWG-Strand	Center-) line)
843-191-3001-XXX	30 AWG (1 × 30)	.050″
843-191-2802-XXX	28 AWG (1 × 28)	.050″
843-191-2601-XXX	26 AWG (7 × 34)	.050″
843-191-2602-XXX	26 AWG (1 × 26)	.050″
843-191-2401-XXX	24 AWG (7 × 32)	.075″

Spectra-Strip®
Spectra-Flex™
high flex life flat cable — 191-2811 series



description

The new Spectra-Flex high flex life flat cable is designed for applications that require repeated flexing without circuit interruption. A typical use would be for printers that need a flexible cable to cyclically travel back and forth, or any other application where constant flexing is required.

order information

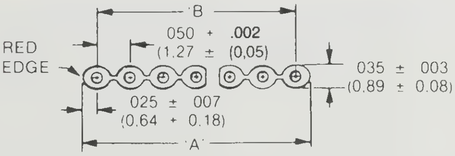
Series 843-191-2811-XXX

Part Number	No. Conds.	Width "A"		Span "B"	
		Inch	(mm)	Inch	(mm)
843-191-2811-010	10	.500	(12,70)	.450 ± .007	(11,43 ± 0,18)
843-191-2811-014	14	.700	(17,78)	.650 ± .007	(16,51 ± 0,18)
843-191-2811-016	16	.800	(20,32)	.750 ± .011	(19,05 ± 0,28)
843-191-2811-020	20	1.000	(25,40)	.950 ± .011	(24,13 ± 0.28)
843-191-2811-026	26	1.300	(33,02)	1.250 ± .011	(31,75 ± 0,28)
843-191-2811-034	34	1.700	(43,18)	1.650 ± .011	(41,91 ± 0,28)
843-191-2811-040	40	2.000	(50,80)	1.950 ± .015	(49,53 ± 0,38)
843-191-2811-050	50	2.500	(63,50)	2.450 ± .015	(62,23 ± 0,38)
843-191-2811-060	60	3.000	(76,20)	2.950 ± .015	(74,93 ± 0,38)
843-191-2811-064	64	3.200	(81,28)	3.150 ± .015	(80,01 ± 0,38)

All of the above constructions are available with nickel coated copper alloy conductors. Simply use part number series 843-191-2812-XXX when ordering.

packaging

Standard put-ups are 100-ft. (30,48 meter) rolls. Consult factory for special put-up requirements.



benefits

- Made with special alloy conductors which can withstand continuous flexing
- Conductor spacing on 0.050″ (1.27mm) centers with one edge conveniently marked for conductor reference, allows IDC mass termination, reduces labor
- UL recognized Я𝐔
- CSA certification available

characteristics

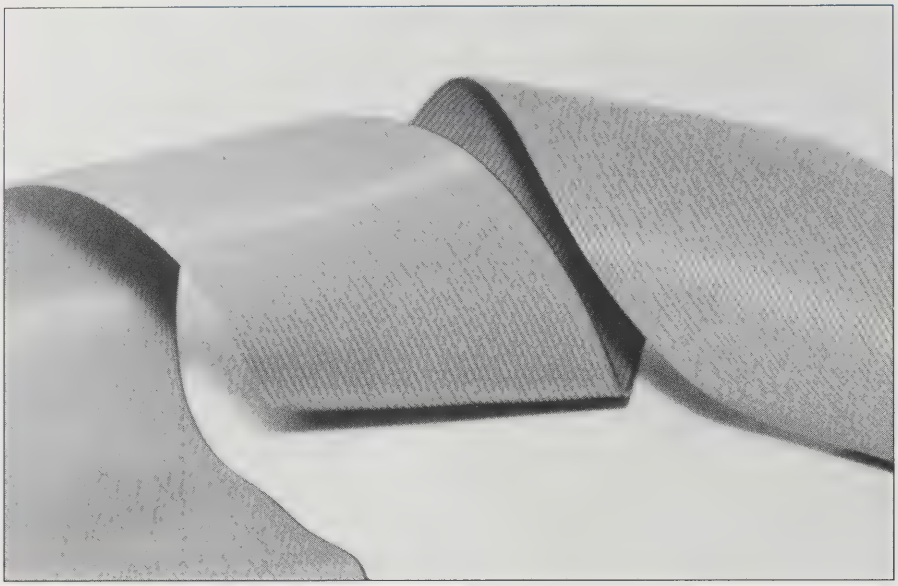
Physical

Conductor: 28AWG, 19/40 silver plated copper alloy
Insulation: PVC
Thickness: .035″ ± .003″
Pitch: .050″ ± .002″
Color: Blue with red edge
Flex life: >100 million cycles ("rolling" flex test, 5½″ stroke with 1″ bend radius)

Electrical

Voltage: 300 volts
Impedance: 100 ohms, nom. (ground-signal-ground)
Capacitance: 14 pf/ft. (45,9 pf/m) nom. (1MHz)
Crosstalk: 10′ sample, 5 ns rise time with 2 lines driven; NE = 3.0%, FE = 4.0% nom.
Propagation delay: 1.4 ns/ft. (4,6 ns/m) nom.
Insulation resistance: 10^{10} ohms—10 ft min.
Temperature rating: 105°C
UL style: Cable style 2651

Spectra-Zip® 1,00 mm planar cable
191-2815 series



description

Spectra-Zip 1,00 mm cable is designed for use with 2,00 mm hard metric mass terminable IDC connectors...a standardized utility connector widely used by disk drive and other manufacturers concerned with effective utilization of available board real estate. This cable is reliable and economical, with controlled electrical characteristics. Spectra-Zip 1,00 mm cable consists of stranded round conductors insulated with extruded PVC. Packaged in 100-foot put-ups.

benefits

- High density center-to-center spacing
- Easy, fast termination to 2,00 mm hard metric IDC connectors
- Easy identification of # 1 conductor with blue edge mark
- Double contour allows termination from either side of cable
- Tear feature allows easy conductor separation for circuit routing without rupturing insulation
- UL and CSA

order information

PART #	# COND	WIDTH A		SPAN B	
		mm	inches	mm	inches
191-2815-010	10	9,89	.3897	8,99±0,20	.3543±.0079
191-2815-014	14	13,89	.5472	12,99±0,20	.5118±.0079
191-2815-016	16	15,90	.6260	15,00±0,20	.5906±.0079
191-2815-020	20	19,89	.7834	18,99±0,20	.7480±.0079
191-2815-024	24	23,89	.9409	22,99±0,20	.9055±.0079
191-2815-026	26	25,90	1.0197	25,00±0,20	.9843±.0079
191-2815-034	34	33,89	1.3346	32,99±0,30	1.2992±.0118
191-2815-040	40	39,89	1.5708	38,99±0,30	1.5354±.0118
191-2815-044	44	43,89	1.7283	42,99±0,30	1.6929±.0118
191-2815-050	50	49,89	1.9645	48,99±0,30	1.9291±.0118
191-2815-060	60	59,89	2.3582	58,99±0,30	2.3228±.0118
191-2815-064	64	63,89	2.5157	62,99±0,35	2.4803±.0138
191-2815-068	68	67,89	2.6724	66,99±0,35	2.6378±.0138
191-2815-075	75	74,89	2.9475	73,99±0,35	2.9134±.0138

Dimensions and characteristics subject to change without notice.

characteristics
physical

Conductors: 28 AWG, 7/36 strand, tinned copper

Insulation: .010" wall extruded, PVC, flame retardant VW-1

Thickness: 0,9 ±0,08 mm (.0354" ±.0031")

Pitch: 1,0 ±0,08 mm (.0394" ±.0031") centers

Color: gray (one blue edge)

Temperature rating: -20°C to +105°C

electrical

Voltage: 300 V

Current rating: 1 amp nominal @ 10°C above ambient

Impedance: 83 ohms nominal

Capacitance: 60,0 pf/m (18.3 pf/ft) nominal @ 1.0 MHz

Inductance: 0,50 μh/m (.15 μh/ft) nominal @ 1.0 MHz

Propagation delay: 5.2 ns/m (1.58 ns/ft) nominal

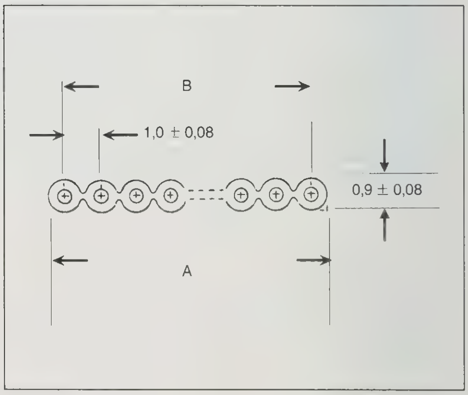
Insulation resistance: 10^{10} ohms - 3 m (10') min.

Unbalanced crosstalk: 3 m (10') sample, 5 ns rise time with 2 lines driven,
near end = 3.1% nominal
far end = 4.0% nominal

Mode: ground-signal-ground

UL: recognized, AWM 2651, meets VW-1

CSA: certified, class I group A, FT-1



TPE Insulated Zip Cable
193-2801 Series

description

TPE Zip Cable is designed to provide faster signal transmission speed and lower capacitance characteristics than equivalent standard flat ribbon cable constructions. The Thermoplastic Elastomer (TPE) insulation allows this cable to be used in more severe operating environments with wider temperature ranges (-65°C to +125°C)

This cable consists of 28 AWG stranded round conductors on .050" centers with an extruded TPE insulation. It is UL recognized at a rating of 125°C, 300 volts (Ref UL Style #20559).

cable selection chart

PART NUMBER	NO. COND.	WIDTH 'A' INCHES	(MM)	SPAN "B" INCHES	(MM)
843-193-2801-009	9	.450	(11,43)	.400 ± .007	(10,16 ± 0,18)
843-193-2801-010	10	.500	(12,70)	.450 ± .007	(11,43 ± 0,18)
843-193-2801-014	14	.700	(17,78)	.650 ± .007	(16,51 ± 0,18)
843-193-2801-015	15	.750	(19,05)	.700 ± .007	(17,78 ± 0,18)
843-193-2801-016	16	.800	(20,32)	.750 ± .011	(19,05 ± 0,28)
843-193-2801-020	20	1.000	(25,40)	.950 ± .011	(24,13 ± 0,28)
843-193-2801-024	24	1.200	(30,48)	1.150 ± .011	(29,21 ± 0,28)
843-193-2801-025	25	1.250	(31,75)	1.200 ± .011	(30,48 ± 0,28)
843-193-2801-026	26	1.300	(33,02)	1.250 ± .011	(31,75 ± 0,28)
843-193-2801-034	34	1.700	(43,18)	1.650 ± .011	(41,91 ± 0,28)
843-193-2801-036	36	1.800	(45,72)	1.750 ± .015	(44,45 ± 0,38)
843-193-2801-037	37	1.850	(47,00)	1.800 ± .015	(45,72 ± 0,38)
843-193-2801-040	40	2.000	(50,80)	1.950 ± .015	(49,53 ± 0,38)
843-193-2801-050	50	2.500	(63,50)	2.450 ± .015	(62,23 ± 0,38)
843-193-2801-060	60	3.000	(76,20)	2.950 ± .015	(74,93 ± 0,38)
843-193-2801-064	64	3.200	(81,28)	3.150 ± .015	(80,01 ± 0,38)

benefits

- Wide range of operating temperatures -65°C to +125°C
- Fast signal speed
- Low capacitance
- UL recognized (UL style no. 20559)

characteristics

Physical

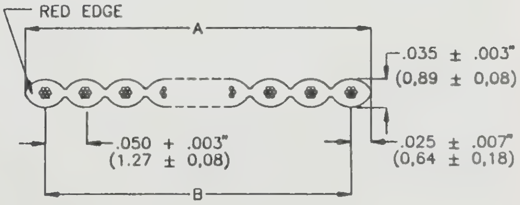
Conductors: 28-7/36 AWG Tinned Copper
Insulation: Extruded TPE, .010" wall
Color: Tan (one edge red)
Temperature Rating:
-65 to 125°C (-85°F to 257°F)
UL Style: 20559 (125°C, 300 volts)

Electrical

Impedance: 115 ohms
Propagation Delay: 1.35 ns/ft
Capacitance at 1 MHz: 11.0 pf/ft
Inductance at 1 MHz: .18 uh/ft
Insulation Resistance:
10^{10} ohms -10 ft. (min)
Unbalanced CrossTalk:
5 ns Risetime (10 ft sample), 2 lines driven
Near End: 3.0% Far End: 3.0%
Note: ground-signal-ground test mode

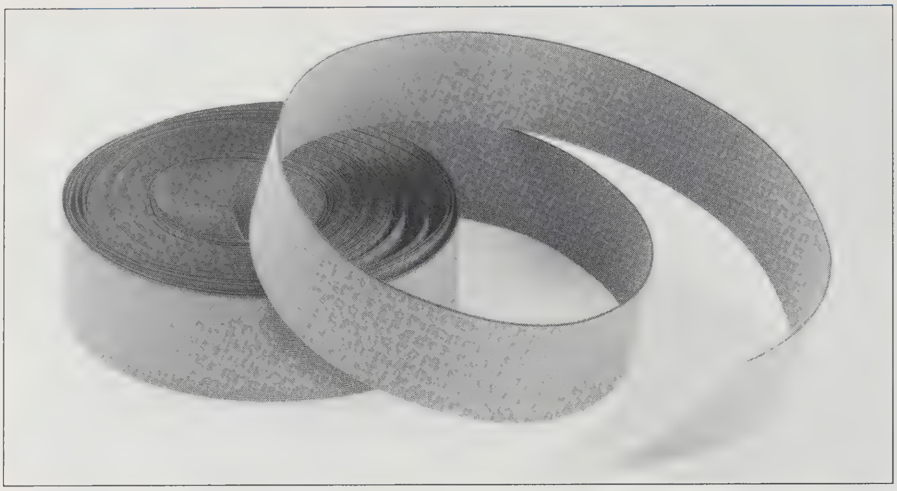
options

- Available with 28-19 AWG stranded conductors on .050" centers for high flex life applications.
- Also available with .025" conductor spacing.
- 193-2811 Series 28-7/36 105°C TPE
- Consult factory for details.



Dimensions and characteristics subject to change without notice.

Spectra-Zip® PVC .025" center cable
191-3X0X series



description

Spectra-Strip® PVC .025" center zip cable is designed to meet industry requirements for interconnect miniaturization. Applications include any system requiring a higher signal density or an inexpensive alternative to transmission cable. Standard put-up is 100' coils. Longer lengths are available upon request.

benefits

- High density center-to-center spacing allows increased miniaturization
- Precise spacing for controlled electrical characteristics
- Easy, fast mass-termination
- Easy identification of # 1 conductor with edge mark
- Double contour allows termination from either side of cable
- UL recognized ᴙ

characteristics

physical

Conductors: copper, see chart below

Insulation: .0075" (0,19mm) wall PVC

Pitch: 0.025"±0.002" (0,64±0,05 mm) centers

Color: gray (one edge black)

Temperature rating: -20°C to +105°C (-4°F to +221°F)

electrical

Voltage: 150 V

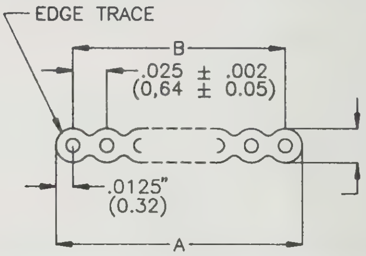
Current rating: 0.8 amps nominal @ 10°C rise above ambient

Propagation delay: 1.60 ns/ft (5,25 ns/m) nominal

Insulation resistance: 10^{10} ohms - 10' (3 m) min.

Crosstalk: 10' (3 m) sample, 5 ns rise time with 2 lines driven, unbalanced mode (see below)

***UL style:* #2678, rated 105°C (+221°F)**

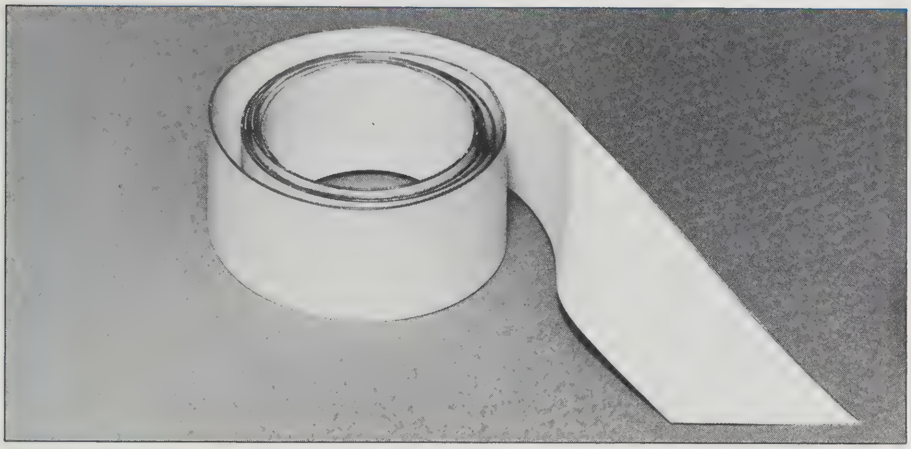


Part Number	**191-3003**	**191-3005**	**191-3203**	**191-3205**
Conductors	30-1 solid bare	30-7/38 tinned	32-1 solid bare	32-7/40 tinned
Thickness	.025"±.002"	.027"±.002"	.023"±.002"	.024"±.002"
Impedance	80 ohms	70 ohms	95 ohms	90 ohms
Capacitance (nominal)	19.0 pf/ft (62,3 pf/m) @ 1 MHz	25.0 pf/ft (82,0 pf/m) @ 1 MHz	18.0 pf/ft (59,06 pf/m) @ 1 MHz	18.0 pf/ft (59,06 pf/m) @ 1 MHz
Inductance (nominal)	.15 μh/ft (,49 μh/m) @ 1.0 MHz	.14 μh/ft (,46 μh/m) @ 1.0 MHz	.17 μh/ft (,56 μh/m) @ 1.0 MHz	.16 μh/ft (,52 μh/m) @ 1.0 MHz
Crosstalk * ground-signal-ground **ground-ground-signal -ground-ground	near end: * 2.6% far end: * 3.7% near end: ** 1.0% far end: ** 2.0%	near end: * 2.6% far end: * 3.7% near end: ** 1.0% far end: ** 2.0%	near end: * 2.6% far end: * 3.7% near end: ** 1.0% far end: ** 2.0%	near end: * 2.6% far end: * 3.7% near end: ** 1.0% far end: ** 2.0%

order information

30-1 BARE SOLID	30-7/38 TINNED	32-1 BARE SOLID	32-7/40 TINNED	# COND	WIDTH A		SPAN B	
PART #	PART #	PART #	PART #		INCHES	(mm)	INCHES	(mm)
191-3003-010	191-3005-010	191-3203-010	191-3205-010	10	.250	(6,35)	.225±.007	(5,72±0,18)
191-3003-016	191-3005-016	191-3203-016	191-3205-016	16	.400	(10,16)	.375±.007	(9,53±0,18)
191-3003-020	191-3005-020	191-3203-020	191-3205-020	20	.500	(12,70)	.475±.007	(12,07±0,18)
191-3003-026	191-3005-026	191-3203-026	191-3205-026	26	.650	(16,51)	.625±.007	(15,88±0,18)
191-3003-034	191-3005-034	191-3203-034	191-3205-034	34	.850	(21,59)	.825±.011	(20,96±0,28)
191-3003-040	191-3005-040	191-3203-040	191-3205-040	40	1.000	(25,40)	.975±.011	(24,77±0,28)
191-3003-050	191-3005-050	191-3203-050	191-3205-050	50	1.250	(31,75)	1.225±.011	(31,12±0,28)
191-3003-060	191-3005-060	191-3203-060	191-3205-060	60	1.500	(38,10)	1.475±.011	(37,47±0,28)
191-3003-064	191-3005-064	191-3203-064	191-3205-064	64	1.600	(40,64)	1.575±.011	(40,01±0,28)
191-3003-068	191-3005-068	191-3203-068	191-3205-068	68	1.700	(43,18)	1.675±.011	(42,55±0,28)
191-3003-080	191-3005-080	191-3203-080	191-3205-080	80	2.000	(50,80)	1.975±.015	(50,17±0,38)
191-3003-100	191-3005-100	191-3203-100	191-3205-100	100	2.500	(63,50)	2.475±.015	(68,87±0,38)

Spectra-Zip® TPE .025" center
193-3X0X series



description

Spectra-Strip® TPE .025" center zip cable accommodates interconnect miniaturization, with the added benefit of improved electrical performance characteristics. Applications include any system requiring higher and faster signal density. Standard put-up is 100' coils. Longer lengths are available upon request.

benefits

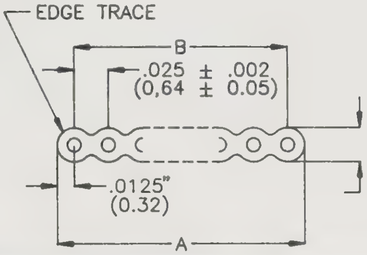
- TPE insulation - lower dielectric constant, higher impedance, and faster signal speeds than PVC cable
- High density center-to-center spacing allows increased miniaturization
- Precise spacing for controlled electrical characteristics
- Easy, fast mass-termination
- Easy identification of # 1 conductor with edge mark
- Double contour allows termination from either side of cable
- UL recognized

characteristics
physical

Conductors: copper, see chart below
Insulation: .0075" (0,19mm) wall TPE
Pitch: 0.025"±0.002" (0,64±0,05mm) centers
Color: white (one edge red)
Temperature rating: -50°C to +105°C (-58°F to 221°F)

electrical

Voltage: 150 V
Current rating: 0.8 amps nominal @ 10°C rise above ambient
Propagation delay: 1.45 ns/ft (4,76 ns/m) nominal
Insulation resistance: 10^{10} ohms. - 10' (3 m) min.
Crosstalk: 10' (3 m) sample, 5 ns rise time with 2 lines driven, unbalanced mode (see chart below)
***UL style:* #20647, rated 105°C (+221°F)**



Part Number	**193-3003**	**193-3005**	**193-3203**	**193-3205**
Conductors	30-1 solid bare	30-7/38 tinned	32-1 solid bare	32-7/40 tinned
Thickness	.025"±.002"	.027"±.002"	.023"±.002"	.024"±.002"
Impedance	88 ohms	80 ohms	105 ohms	95 ohms
Capacitance (nominal)	16.5 pf/ft (54,1 pf/m) @ 1 MHz	19.0 pf/ft (62,3 pf/m) @ 1 MHz	14.0 pf/ft (45,9 pf/m) @ 1 MHz	17.0 pf/ft (55,8 pf/m) @ 1 MHz
Inductance (nominal)	.15 μh/ft (,49 μh/m) @ 1.0 MHz	.14 μh/ft (,46 μh/m) @ 1.0 MHz	.17 μh/ft (,56 μh/m) @ 1.0 MHz	.15 μh/ft (,49 μh/m) @ 1.0 MHz
Crosstalk * ground-signal-ground **ground-ground-signal -ground-ground	near end: * 2.7% far end: * 3.3% near end: ** 1.0% far end: ** 1.6%	near end: * 3.1% far end: * 3.6% near end: ** 1.0% far end: ** 1.9%	near end: * 3.0% far end: * 3.6% near end: ** 1.2% far end: ** 2.2%	near end: * 3.1% far end: * 3.4% near end: ** 1.0% far end: ** 2.0%

order information

30-1 BARE SOLID	30-7/38 TINNED	32-1 BARE SOLID	32-7/40 TINNED	# COND	WIDTH A		SPAN B	
PART #	PART #	PART #	PART #		INCHES	(mm)	INCHES	(mm)
193-3003-010	193-3005-010	193-3203-010	193-3205-010	10	.250	(6,35)	.225±.007	(5,72±0,18)
193-3003-016	193-3005-016	193-3203-016	193-3205-016	16	.400	(10,16)	.375±.007	(9,53±0,18)
193-3003-020	193-3005-020	193-3203-020	193-3205-020	20	.500	(12,70)	.475±.007	(12,07±0,18)
193-3003-026	193-3005-026	193-3203-026	193-3205-026	26	.650	(16,51)	.625±.007	(15,88±0,18)
193-3003-034	193-3005-034	193-3203-034	193-3205-034	34	.850	(21,59)	.825±.011	(20,96±0,28)
193-3003-040	193-3005-040	193-3203-040	193-3205-040	40	1.000	(25,40)	.975±.011	(24,77±0,28)
193-3003-050	193-3005-050	193-3203-050	193-3205-050	50	1.250	(31,75)	1.225±.011	(31,12±0,28)
193-3003-060	193-3005-060	193-3203-060	193-3205-060	60	1.500	(38,10)	1.475±.011	(37,47±0,28)
193-3003-064	193-3005-064	193-3203-064	193-3205-064	64	1.600	(40,64)	1.575±.011	(40,01±0,28)
193-3003-068	193-3005-068	193-3203-068	193-3205-068	68	1.700	(43,18)	1.675±.011	(42,55±0,28)
193-3003-080	193-3005-080	193-3203-080	193-3205-080	80	2.000	(50,80)	1.975±.015	(50,17±0,38)
193-3003-100	193-3005-100	193-3203-100	193-3205-100	100	2.500	(63,50)	2.475±.015	(68,87±0,38)

Fast 20/40 SCSI
193-3099-991

description

Spectra-Strip's new Fast 20/40 SCSI cable is designed to comply with the recently released ANSI standard for Fast 20 SCSI devices operating at 20 MB data rates.

Two versions of the cable are offered: 50 conductor 26 AWG on .050" centers PVC for 8 bit narrow applications *(see part number 191-2601-150)*, and 68 conductor 30 AWG on .025" centers for 16 and 32 bit wide applications *(part number 193-3099-991)*.

With the new cable, characteristic impedance is higher (and tighter) at 90 ±6 ohms and signal to signal skew is controlled to within .036 ns/ft max, to accomodate the higher frequency fast 20 signals.

benefits

- Allows implementors of the new Fast 20/40 SCSI (also known as Ultra SCSI) to double SCSI 3's data rate to 20 or 40 megabytes.
- Full compatibility with existing SCSI connectors
- Improved signal shape and timing.

characteristics

Physical

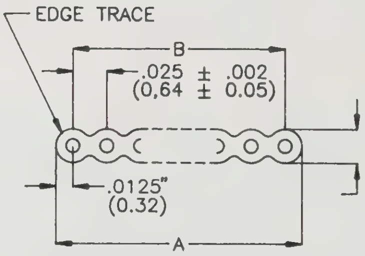
Conductors: (68) 30-1 bare copper
Insulation: Polyolefin
Color: White, one edge red
Conductor Spacing: .025" ±0.002"

Electrical

Impedance: 90 ±6 ohms
Capacitance: 14.1 pf/ft @ 1MHz
Inductance: .317 µH/ft @ 1MHz
Propagation Delay: 1.34 ns/ft
Propagation Delay Skew: .036 ns/ft max.
DC Resistance: 104 ohms/1,000' - 10' minimum

Above values measured in the ground-signal-ground configuration

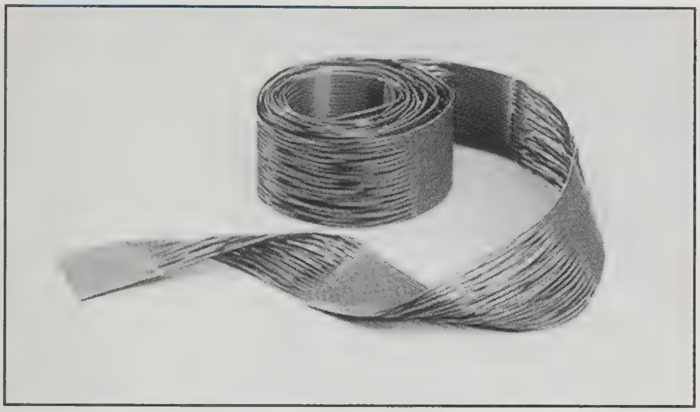
UL Recognized **CSA AWM FT-1**



PART #	# COND	WIDTH A (nominal)		SPAN B	
		INCHES	(mm)	INCHES	(mm)
193-3099-991	68	1.695	(43,18)	1.675 ±.006	(42,54 ±0,15)

Dimensions and characteristics subject to change without notice.

.025" loose pair Twist'N'Flat planar cable
425 series



description

For internal single ended or differential SCSI applications requiring twisted pairs, Spectra-Strip now offers mass termination on .025" centers with its new .025" Twist'N'Flat. Unique in the industry, this is the only cable to offer programmable twist length sections (up to a maximum of 10) and loose, unbonded twisted pairs for a maximum in cable flexibility and improved airflow within the cabinet. Compared with traditional hand lamination methods, .025" Twist'N'Flat affords considerable end product cost savings.

benefits

- Offers reduced total assembly costs over current labor-intensive discrete or hand-lamination methods.
- Up to ten twist length combinations are available.
- Loose pairs between IDC flats allows increased airflow around the assembly.
- Terminates to industry standard .025" IDC connectors
- Double sided lamination provides excellent conductor strain relief.

characteristics

Physical

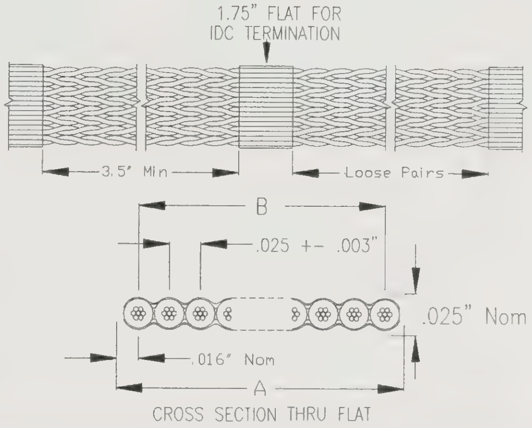
Conductors: 30 AWG 7/38 strand, tinned copper
Insulation: .006" PVC
Color Code: 1st pair red/gray followed by blue/gray and repeat
Laminate: Polyester
Temperature Rating: 80°C

Electrical

Impedance:	110 ohms[1]	95 ohms[2]	120 ohms[3]
Capacitance:	13 pf/ft[1]	18 pf/ft[2]	13 pf/ft[3]

Propagation Delay: 1.5 ns/ft
Voltage Rating: 150 volts
Current Rating: 0.75 amp
DC Resistance: 106 ohm/1,000'
Attenuation (5MHz): 4 dB/100'
Attenuation (10 MHz): 5 dB/100'

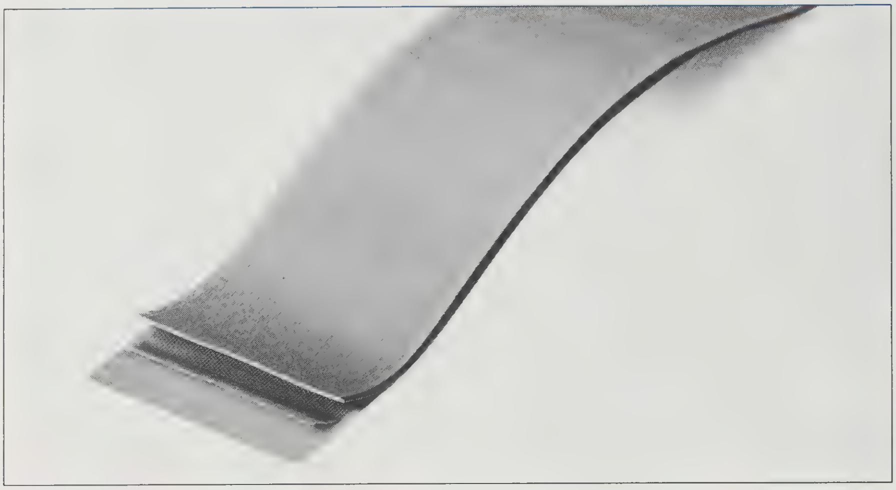
[1] Measured single-ended
[2] Measured single-ended with one conductor of each pair commoned to one bus (SCSI mode)
[3] Measured differentially



PART #	# COND	# PAIRS	WIDTH A (nominal)		SPAN B	
			INCHES	(mm)	INCHES	(mm)
425-3006-010	10	5	0.257	(6,53)	0.225 ±.010	(5,72 ±0,25)
425-3006-014	14	7	0.357	(9,07)	0.325 ±.010	(8,26 ±0,25)
425-3006-016	16	8	0.407	(10,34)	0.375 ±.010	(9,53 ±0,25)
425-3006-020	20	10	0.507	(12,88)	0.475 ±.010	(12,07 ±0,25)
425-3006-026	26	13	0.657	(16,69)	0.625 ±.010	(15,88 ±0,25)
425-3006-034	34	17	0.857	(21,77)	0.825 ±.010	(20,96 ±0,25)
425-3006-036	36	18	0.907	(23,04)	0.875 ±.010	(22,23 ±0,25)
425-3006-040	40	20	1.007	(25,58)	0.975 ±.010	(24,77±0,25)
425-3006-050	50	25	1.257	(31,93)	1.225 ±.010	(31,12 ±0,25)
425-3006-060	60	30	1.507	(38,28)	1.475 ±.010	(37,47 ±0,25)
425-3006-064	64	32	1.607	(40,82)	1.575±.010	(40,01 ±0,25)
425-3006-068	68	34	1.707	(43,36)	1.675 ±.010	(42,55 ±0,25)
*425-3006-080	80	40	2.007	(50,98)	1.975 ±.010	(50,17 ±0,25)
*425-3006-100	100	50	2.507	(63,68)	2.475 ±.010	(62,87 ±0,25)

*Consult factory for availability

Spectra-GP® .025" center ground plane planar cable 133-301X series



description

Spectra-GP® .025" Ground Plane Cable is especially suited to applications in computer and communications equipment for data transmission and switching, where reduced cross-talk is necessary. Ground plane cable consists of stranded uninsulated conductors laminated between PVC film. The ground plane consists of expanded copper mesh, lamininated at a controlled distance from the conductors, and enclosed with an outer layer of PVC film. Ground plane cable is available with or without a drain wire.

benefits

- interconnect miniaturization to .025" centers
- Integrally laminated ground plane reduces cross-talk
- Mass terminable
- Put-up in convenient 100' coils
- Custom capabilities available:
  Single or multiple drain wires, in any position
- UL recognized

characteristics

physical

Conductors and drain wire: 30 AWG solid copper conductors, 30-7/38 AWG tinned copper drain wire

Ground plane: expanded copper mesh .005" (0,13mm) thick

Laminate: .0123" (0,31mm) gray PVC

Thickness: .045" (1,27mm) nom.

Pitch: .025 ± .002" (0,64±0,08mm) centers

Color: gray

Edge mark: red: (no drain wire)
black: (drain wire in #1 position)

electrical

Voltage: 300 V

Current rating: 0.8 amp nominal @ 10°C above ambient

Temperature rating: -20°C to +105°C (-4°F to 221°F)

Impedance: 65 ohms nominal*

Capacitance: 30.0 pf/ft. (98,43 pf/m) nominal @ 1.0 MHz*

Inductance: .14 μh/ft. (,46 μh/m) nominal @ 1.0 MHz*

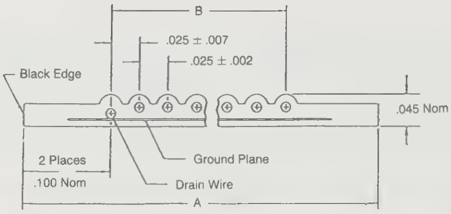
Propagation delay: 1.65 ns/ft. (5,41 ns/m) nominal

Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.

Unbalanced crosstalk: 10' sample, 5 ns rise time with 2 lines driven, near end = 1.1% nominal far end = 2.3% nominal

* *Measured from conductor to ground plane*

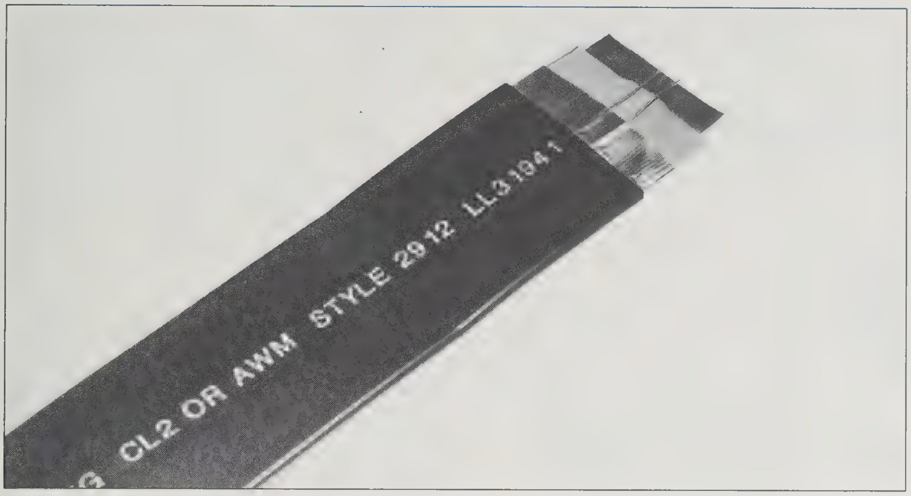
***UL:* #2682 105°C, 300 volts**



order information

E-Z PEEL GP W/ DRAIN WIRE	E-Z PEEL GP W/O DRAIN WIRE	# COND	WIDTH A		SPAN B	
PART #	PART #		INCHES	(mm)	INCHES	(mm)
133-3014-010	133-3013-010	10	.425	(10,80)	.225±.005	(5,72±13)
133-3014-016	133-3013-016	16	.575	(14,61)	.375±.005	(9,53±0,13)
133-3014-020	133-3013-020	20	.675	17,15)	.475±.005	(12,07±0,13)
133-3014-026	133-3013-026	26	.825	(20,96)	.625±.005	(15,88±0,13)
133-3014-034	133-3013-034	34	1.025	(26,04)	.825±.005	(20,96±0,13)
133-3014-040	133-3013-040	40	1.175	(29,85)	.975±.006	(24,77±0,15)
133-3014-050	133-3013-050	50	1.425	(36,20)	1.225±.006	(31,12±0,15)
133-3014-060	133-3013-060	60	1.675	(42,55)	1.475±.006	(37,47±0,15)
133-3014-064	133-3013-064	64	1.775	(45,09)	1.575±.006	(40,01±0,15)
133-3014-080	133-3013-080	80	2.175	(55,25)	1.975±.006	(50,17±0,15)
133-3014-100	133-3013-100	100	2.475	(62,87)	2.475±.007	(62,87±0,18)

Spectra-Zip® .025" center shielded & jacketed planar cable 151-3033-XXX series

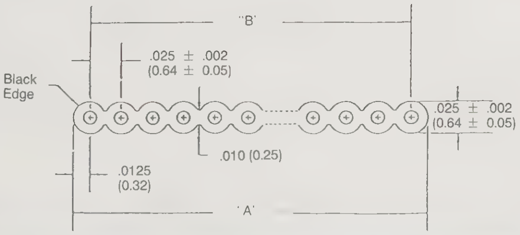


description

Spectra-Zip® Jacketed & Shielded Cable is well-suited to applications such as external interconnect applications that require EMI/ RFI considerations. The cable is jacketed in rugged extruded black PVC - Spectra-Guard®, which provides excellent abrasion resistance. Shielding consists of aluminum/poly, with optional drain wires, making it ideal for high-speed data processing equipment and high frequency communications systems.

benefits

- Rugged, flexible protection
- Excellent crosstalk and electrical performance
- High density center-to-center spacing allows increased miniaturization
- Shielding reduces cross-talk
- Precise spacing for controlled electrical characteristics
- Mass terminable
- Put-up in convenient 100' coils
- Easy to identify #1 conductor with edge mark
- UL recognized



characteristics

physical

Conductors: 30 AWG, solid bare copper

Shielding: aluminum poly

Insulation: .0075" (0,19mm) wall PVC

Zip thickness: .025±.002" (0,64±0,05mm) ref.

Jacket: black PVC, 30 mil avg.

Pitch: .025±.002" (0,64±0,05mm) centers

Color: gray (one edge black)

electrical

Voltage: 150 V

Current rating: 0.8 amp nominal @ 10°C above ambient

Temperature rating: -20°C to +105°C (-4°F to 221°F)

Impedance: 55 ohms nominal*

Capacitance: 30.0 pf/ft. (98,4 pf/m) nominal @ 1.0 MHz*

Inductance: .12 μh/ft. (,39 μh/m) nominal @ 1.0 MHz*

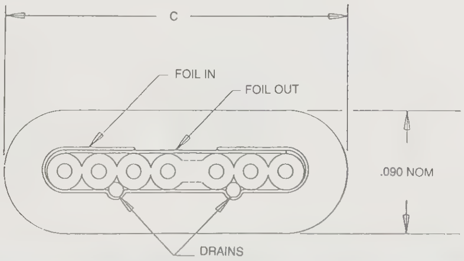
Propagation delay: 1.55 ns/ft. (5,09 ns/m) nominal

Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.

Unbalanced crosstalk: 10' sample, 5 ns rise time with 2 lines driven,
near end = .8% nominal
far end = 1.8% nominal

**Mode:* ground-signal-ground, shield grounded

UL: **inner: #2678**
jacket: #2912



order information

PART #	# COND	WIDTH A		SPAN B		WIDTH C	
		INCHES	(mm)	INCHES	(mm)	INCHES	(mm)
151-3033-010	10	.250	(6,35)	.225±.005	(5,72±0,13)	.315	(8.0)
151-3033-016	16	.400	(10,16)	.375±.005	(9,53±0,13)	.465	(11,81)
151-3033-020	20	.500	(12,70)	.475±.005	(12,07±0,13)	.565	(14,35)
151-3033-026	26	.650	(16,51)	.625±.005	(15,88±0,13)	.715	(18,16)
151-3033-034	34	.850	(21,59)	.825±.005	(20,96±0,13)	.915	(23,24)
151-3033-040	40	1.000	(25,40)	.975±.006	(24,77±0,15)	1.065	(27,05)
151-3033-050	50	1.250	(31,75)	1.225±.006	(31,12±0,15)	1.315	(33,40)
151-3033-060	60	1.500	(38,10)	1.475±.006	(37,47±0,15)	1.565	(39,75)
151-3033-080	80	2.000	(50,80)	1.975±.006	(50,17±0,15)	2.065	(52,45)
151-3033-100	100	2.500	(63,50)	2.475±.007	(62,87±0,18)	2.565	(65,15)

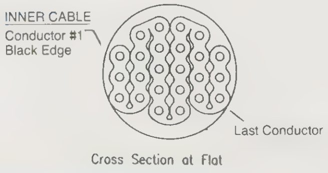
Spectra-Strip® .025″ center Round’N’Flat™ cable 159-3003-XXX series

description

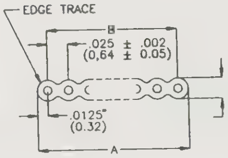
Spectra-Strip® .025" Round’N’Flat℠ Cable combines mass-terminated interconnect miniaturization with the easier routing features of round cable. A repetitive sequence of slitted sections provides a choice of MIDC or hand termination. Shielding options are available to meet application requirements. The inner cable is extruded Spectra-Zip® with alternating sections that are flat. The alternating flat and slit sections also offer an advantage over standard round cable for hand termination, as conductor positions are held in sequence for easy identification.

benefits

- High-density .025" center-to-center spacing
- Helps meet FCC requirements for EMI/RFI suppression
- Round cable / mass-terminable
- Flat sections keep conductors aligned for conductor positioning if hand-terminating
- Edge mark on #1 conductor for easy identification
- Custom capabilities available:
- UL Listed CL2



Cross Section at Flat



characteristics

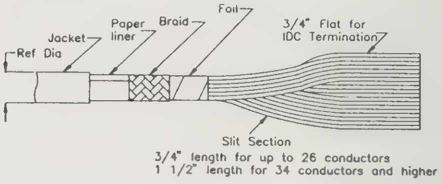
physical

Conductors: 30 AWG
solid bare copper
Insulation: .0075" (0,19mm) wall PVC
Zip cable: gray
pitch: .025"±.002" (0,64±0,05mm)
thickness: .025"±.002" (0,64±0,05mm)
Shielding: aluminum/polyester tape, tinned copper braid w/ min. 85% coverage
Jacket: black PVC .030" wall, paper liner between jacket & core
Temperature rating: -20°C to 105°C (-4°F to +221°F)

electrical

Voltage: 150 V
Impedance: 65 ohms nominal
Capacitance: 27 pf/ft. (88,6 pf/m) nominal @ 1.0 MHz
Inductance: .12 μh/ft. (,39 μh/m) nominal @ 1.0 MHz
Propagation delay: 1.6 ns/ft. (5,25 ns/m) nominal
Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.
Unbalanced crosstalk: 10’ sample, 5 ns rise time with 2 lines driven,
near end = 2.4% nominal
far end = 1.0% nominal
Mode: ground-signal-ground, shield grounded
***UL:* inner: 2678, composite: CL2**

COMPOSITE


Foil
Paper liner
Braid
Jacket
Ref Dia
3/4" Flat for IDC Termination
Slit Section
3/4" length for up to 26 conductors
1 1/2" length for 34 conductors and higher

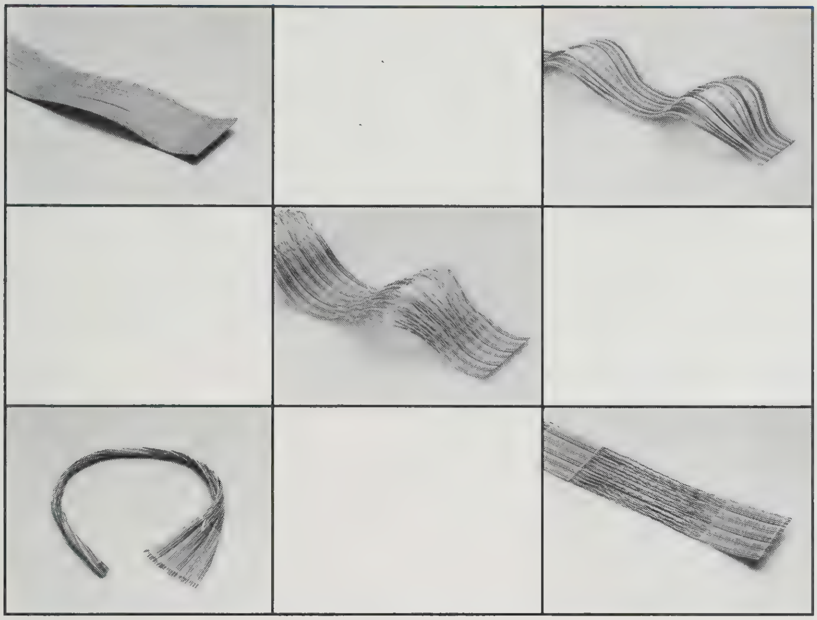
order information

W/FOIL/BRAID SHIELD & JACKET	W/FOIL SHIELD & JACKET, NO BRAID	W/CLEAR POLY & JACKET, NO SHIELD	# COND	WIDTH A ZIP PROFILE		SPAN B ZIP PROFILE		*REF DIA.
PART #	PART #	PART #		INCHES	(mm)	INCHES	(mm)	-0XX
159-3003-010	159-3003-110	159-3003-210	10	.250	(6.35)	.225±.007	(5.72±0.18)	.270
159-3003-016	159-3003-116	159-3003-216	16	.400	(10.16)	.375±.007	(9.53±0.18)	.275
159-3003-020	159-3003-120	159-3003-220	20	.500	(12.70)	.475±.007	(12.07±0.18)	.280
159-3003-026	159-3003-126	159-3003-226	26	.650	(16.51)	.625±.007	(15.88±0.18)	.285
159-3003-034	159-3003-134	159-3003-234	34	.850	(21.59)	.825±.011	(20.96±0.28)	.295
159-3003-040	159-3003-140	159-3003-240	40	1.000	(25.40)	.975±.011	(24.77±0.28)	.305
159-3003-050	159-3003-150	159-3003-250	50	1.250	(31.75)	1.225±.011	(31.12±0.28)	.320
159-3003-060	159-3003-160	159-3003-260	60	1.500	(38.10)	1.475±.011	(37.47±0.28)	.340
159-3003-064	159-3003-164	159-3003-264	64	1.600	(48.64)	1.575±.011	(40.01±0.28)	.350
159-3003-080	159-3003-180	159-3003-280	80	2.000	(50.80)	1.975±.015	(50.17±0.38)	.380
159-3099-994	TBD	TBD	100	2.500	(63.50)	2.475±.015	(62.87±0.38)	.415

TBD = to be determined   * Reference diameter for -1XX and -2XX are .020" or .030" smaller than above

Standard put-up is 100 feet on cardboard reels. Consult factory for larger put-ups.

Amphenol Spectra-Strip Slit Cable Capabilities



Benefits:

- Cable can be routed away from components and board for improved air flow.
- Cable routing is easier through almost any space.
- Combines the advantages of flat cable mass IDC termination with the flexibility and ease of routing provided by discrete wire.
- Can accommodate multiple configurations of routing within one cable assembly, through programmable custom slit & unslit sections, or loose twisted pair sections.

Introduction

Slit cable options fall into two categories: FIXED for extruded (Zip) cable, and PROGRAMMABLE for Zip or Laminated (Color Coded and Twist'N'Flat cable).

The programmable option provides for up to five different unslit/slit length combinations on a repetitive cycle

With the exception of Twist'N'Flat cable, slitting is done on .050" centers such that every conductor of a .050" pitch cable is separated and every other conductor of a .025" pitch cable is separated. Twist'N'Flat cable employs .100" center slitters such that each pair is separated.

AWG's from 26 solid to 32-7/40 are included, for all cable, within pitch and tooling limitations.

Slit dimensions have a tolerance of +/- 0.125" in lengths of 6" or less: +/- 0.250" in lengths greater than 6", and +/- 0.250 in programmed (multiple) lengths.

Instructions:

Please select the type of slit cable desired. Copy the order form and fill in the Ordering Information and the Customer Information. Fax the form(s) to the fax number shown. A ten digit part number will be promptly assigned to your custom slit cable. If you have any question, please do not hesitate to call for assistance.

Contents:

Spectra-Zip Planar Cable
491 Series 32

3C Color Coded Planar Cable
135 Series 33

Twist'N'Flat Planar cable
132 Series 34

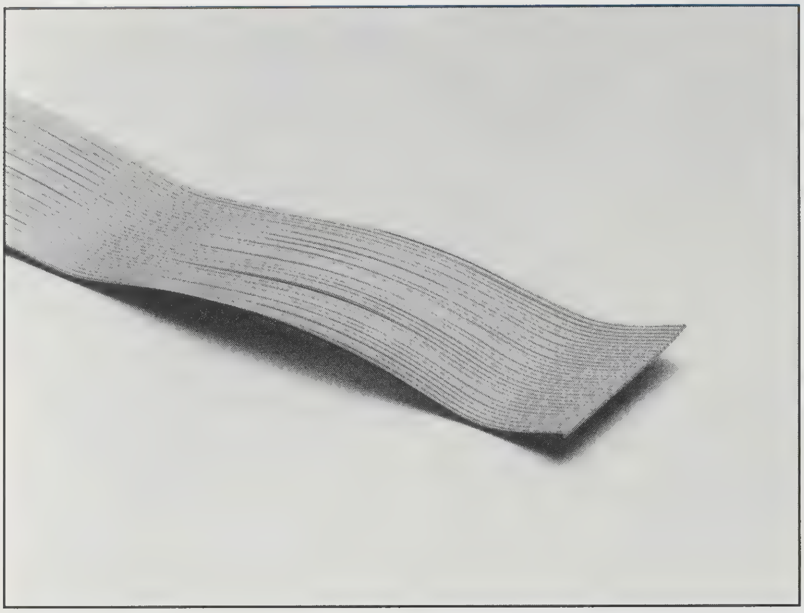
Loose Pair Round Twist'N'Flat Cable
432-2802, 433-2802 Series 35

Loose Pair Flat Twist'N'Flat Cable
432-2806, 433-2806 Series 36

Amphenol
SPECTRA-STRIP

720 Sherman Ave., Hamden CT 06514
Fax: (203) 281-5872
Phone: (203) 281-3200
(800) 846-6400

Spectra-Zip Slit Zip Planar Cable



Characteristics

- .050" (+/- .002") Pitch
- Conductors: 28 AWG, 7/36 strand tinned copper
- Color: gray (one edge red)
- .050" Pitch Cable Thickness: .035" +/- .003"
- Insulation: PVC, flame retardant VW-1
- Voltage Rating: 300V
- Current Rating: 1 amp nominal@ 10°C
- Temperature Rating: -20°C to 105°C (-4°F to 221°F)
- UL Style: #2651, CSA available
- # of Programmable Lengths Available; up to five different combinations of slit & unslit within one cable
- Length Tolerances: .125" on slit & unslit lengths
- Minimum Slit Length: 0.75"
- Minimum Unslit Length: 0.75"
- Other Capabilities:
  .025" center cable, slit every two conductors
  .050" center cable, slit every two conductors
  other gauges and strands available
  Fixed: 1000' minimum order quantity
  3/4" unslit, 3/4 slit, repeat
  1" unslit, 1 3/4" slit, repeat
  3/4" unslit, 1 1/2" slit, repeat
  1 1/2" unslit, 4" slit, repeat
  PROGRAMMABLE: 5000' minimum order quantity
  (You define unslit, slit dimensions)

Ordering Information:

Overall put-up length: ____________ Measure in: feet ☐ meters ☐

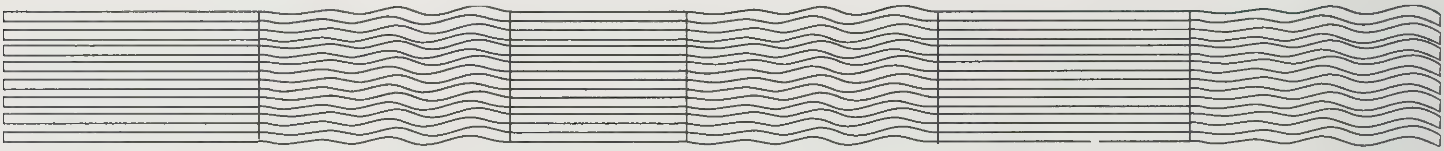
Slit: Every conductor ☐
Every two conductors ☐

AWG: ________________
Strand: ________________
Spacing: ________________

# of conductors: ________________

Slit length measure in: inches ☐ mm ☐

Indicate each unslit and slit length in spaces below.
Write in "repeat", if appropriate.



_______ Unslit _______ Slit _______ Unslit _______ Slit _______ Unslit _______ Slit

Date ________________________

This request for pricing is made by:

Name ____

Title ____

Company ____

Address ____

City ____________________ State ____________________ Zip __________

Phone No. (_______) ____

Fax No. (_______) ____

Comments: ____

____

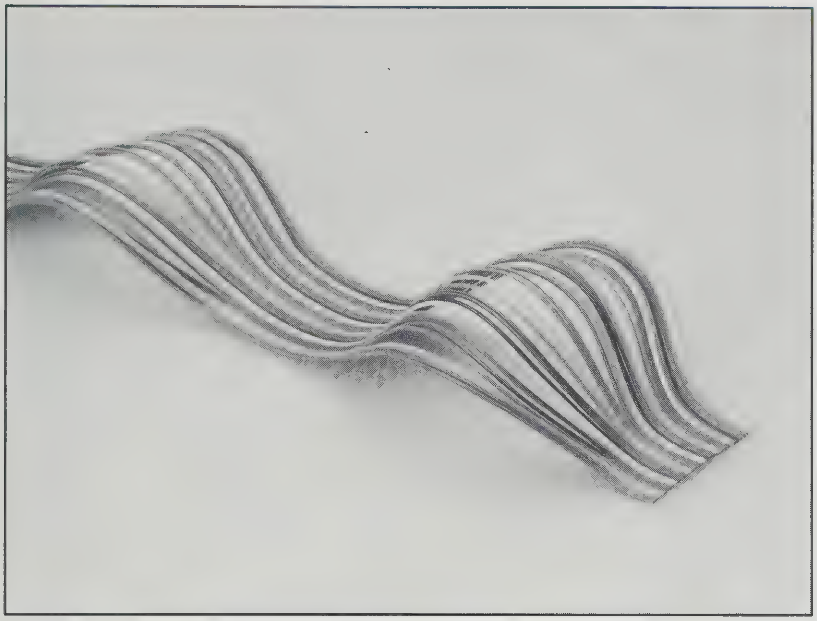
Factory Part Number (will be assigned)

Copy & Fax to: Cable Marketing Manager

Amphenol
SPECTRA-STRIP

Fax: (203) 281-5872
Phone: (203) 281-3200
(800) 846-6400

Slit 3C Color Coded Cable



Characteristics

- .050" (+/-.005") Pitch
- Conductors: 28 AWG, 7/36 stranded tinned copper
- Color: brown, red, orange, yellow, green, blue, violet, gray, white, black (repeat)
- Cable Thickness: .042" +/- .003
- Insulation: PVC, flame retardant VW-1
- Laminate: clear PVC, self-extinguishing
- Voltage Rating: 300V
- Current Rating: 1 amp nominal @ 10°C (221°F) available
- UL Style: #2697, CSA available, 105°C UL style available
- # of Programmable Lengths Available: up to five different combinations of slit & unslit within one cable
- Length Tolerances: Slit dimensions have a tolerance of +/- 0.125" in programmed (multiple) lengths
- PROGRAMMABLE: 2500' minimum order quantity (you define unslit, slit dimensions)

Ordering Information:

Overall put-up length: ____________ Measure in: feet ☐ meters ☐

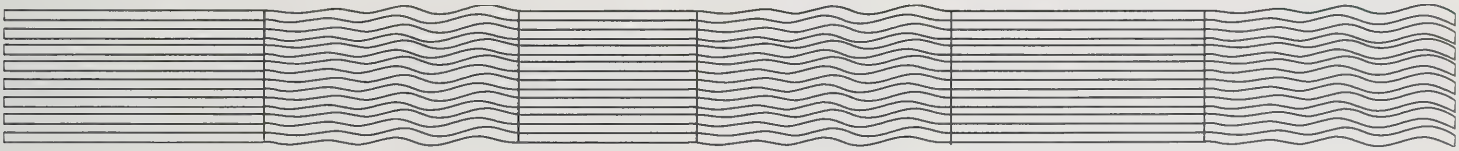
Slit: Every conductor ☐
Every two conductors ☐

AWG: ____________
Strand: ____________
Spacing: ____________

# of conductors: ____________
(72 maximum)

Slit length measure in: inches ☐ mm ☐

Indicate each unslit and slit length in spaces below.
Write in "repeat", if appropriate.



______ Unslit ______ Slit ______ Unslit ______ Slit ______ Unslit ______ Slit

Factory Part Number (will be assigned)

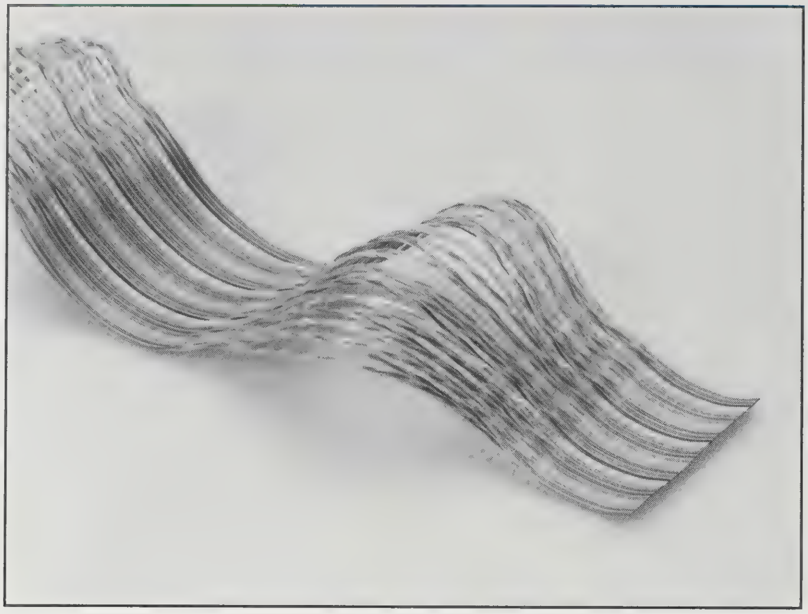
Date ____________
This request for pricing is made by:
Name ____________
Title ____________
Company ____________
Address ____________
City ____________ State ____________ Zip ____________
Phone No. (______) ____________
Fax No. (______) ____________
Comments: ____________

Copy & Fax to: Cable Marketing Manager

Amphenol
SPECTRA-STRIP

Fax: (203) 281-5872
Phone: (203) 281-3200
(800) 846-6400

Slit Flat Twist'N'Flat Planar Cable



Characteristics

- .050" (+/- .005") Pitch
- Conductors: 28 AWG, 7/36 strand tinned copper
- Color: brown, red, orange, yellow, green, blue, violet, gray, white, black (repeat) - tan common
- Cable Thickness: .042" +/- .003"
- Insulation: PVC, flame retardant VW-1
- Laminate: clear PVC, self-extinguishing
- Voltage Rating: 300V
- Current Rating: 1 amp nominal @ 10°C
- Temperature Rating: -20°C to 80°C (14°F to 176°F)
- UL Style: #2697, CSA available, 105°C UL style available
- # of Programmable Lengths Available: up to five different combinations of flat and five different combinations of twisted pair lengths available (total of 10 combined) within one cable
- Length Tolerances: slit dimensions have a tolerance of +/- 0.125" in lengths of 6" or less; +/- 0.250 in lengths greater than 6", and +/0 0.250 in programmed (multiple) lengths.
- Single Program:
  Minimum Twisted Pair Length: 5"
  Minimum Flat Length: 1"
- Multiple Program:
  Minimum Twisted Pair Length: 6"
  Minimum Flat Length: 1.5"
- PROGRAMMABLE: 1000' MINIMUM ORDER QUANTITY

Ordering Information:

Overall put-up length: ____________ Measure in: feet ☐ meters ☐

Slit: Between each pair

AWG: ____________

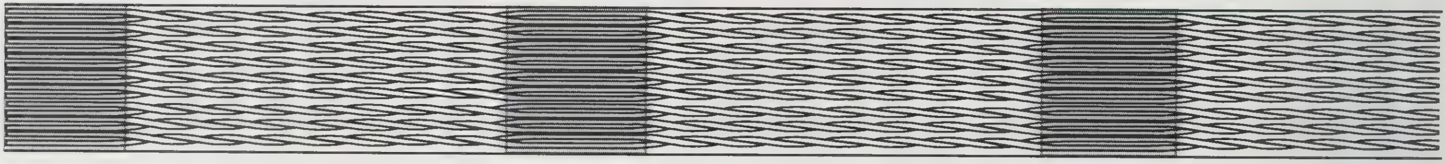
Strand: ____________

Spacing: ____________

# of conductors: ____________
(68 Maximum)
(34 twisted pair)

Slit length measure in: inches ☐ mm ☐

Indicate each unslit flat and slit between pairs length in spaces below.
Write in "repeat", if appropriate.



______ Flat
______ Slit Between Pairs
______ Flat
______ Slit Between Pairs
______ Flat
______ Slit Between Pairs

Factory Part Number (will be assigned)

Customer Information:

Date ____________

This request for pricing is made by:

Name ____________

Title ____________

Company ____________

Address ____________

City ____________ State ____________ Zip ____________

Phone No. (______) ____________

Fax No. (______) ____________

Comments: ____________

Copy & Fax to: Cable Marketing Manager

Amphenol
SPECTRA-STRIP

Fax: (203) 281-5872
Phone: (203) 281-3200
(800) 846-6400

Spectra-Strip Slit Construction
Custom Order Checklist

432-2802 / 433-2802 Series
2.5″ Flat 1.75″ Flat (round form)

Round Loose Pair Twist'N'Flat Planar Cable

Characteristics

- .050" (+/- .005") Pitch
- Conductors: 28 AWG, 7/36 strand tinned copper
- Color: brown, red, orange, yellow, green, blue, violet, gray, white, black (repeat) - tan common
- Cable Thickness: .042" +/- .003"
- Insulation: PVC, flame retardant VW-1
- Flat Laminate: clear PVC, self-extinguishing
- Voltage Rating: 300V
- Current Rating: 1 amp nominal @ 10°C
- Temperature Rating: -20°C to 105°C (-4°F to 221°F)
- UL Style: AWM #20130, CSA available
- # of Programmable Lengths Available: up to ten different twisted pair lengths available
- Cable is provided in round bundled form. For flat configuration, see page 34.

432-2802 Series

- Flat length: 2.5″ ± .125″
- Minimum twisted pair length: 6″ ± .500″

433-2802 Series *NEW!*

- Flat length: 1.75″ ± .125″
- Minimum twisted pair length: 4″ ± .500″

Ordering Information:

Overall put-up length: ____________ Measure in: feet ☐ meters ☐

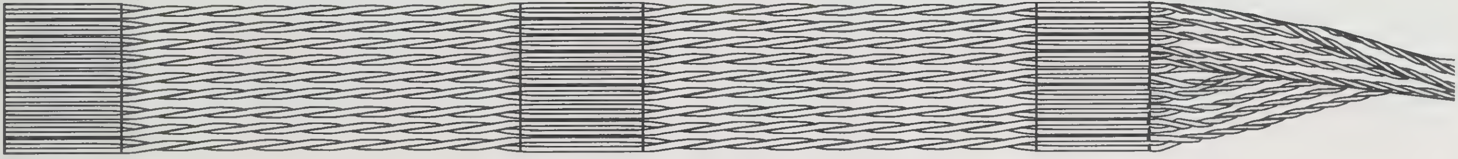
Loose twisted pairs provided in round form

AWG: ________________
Strand: ________________
Spacing: ________________

# of conductors: ________________
(68 maximum)
(34 Twisted Pair)

Slit length measure in: inches ☐ mm ☐

Indicate each unslit flat and loose pair length in spaces below.
Write in "repeat", if appropriate.



______	______	______	______	______	______
Flat	Loose Pairs	Flat	Loose Pairs	Flat	Loose Pairs

Factory Part Number (will be assigned)

Customer Information:

Date ________________________
This request for pricing is made by:
Name ________________________
Title ________________________
Company ________________________
Address ________________________
City ________________ State ________________ Zip ________
Phone No. (_______) ________________________
Fax No. (_______) ________________________
Comments: ________________________

Copy & Fax to: Cable Marketing Manager

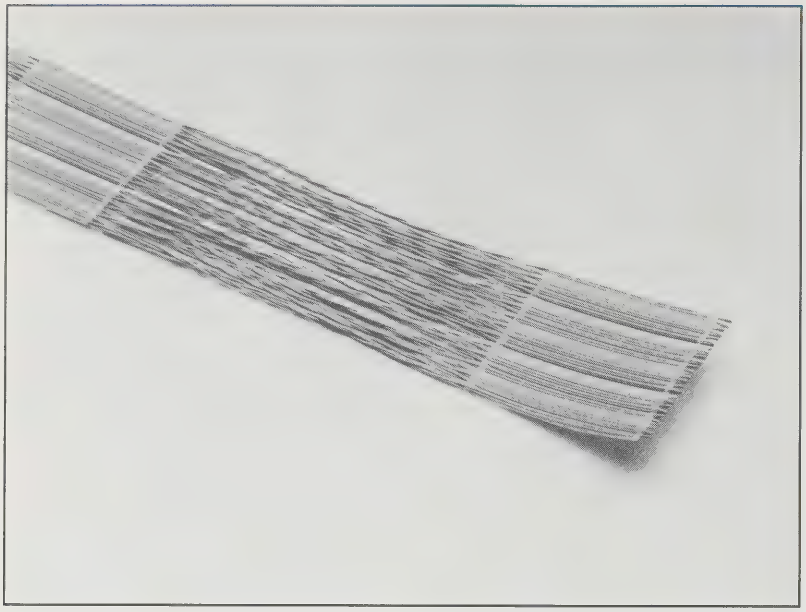
Amphenol
SPECTRA-STRIP

Fax: (203) 281-5872
Phone: (203) 281-3200
(800) 846-6400

Spectra-Strip Slit Construction
Custom Order Checklist

432-2806 / 433-2806 Series
2.5″ Flat 1.75″ Flat (provided flat)

Flat Loose Pair Twist'N'Flat Planar Cable



Characteristics

- .050" (+/- .005") Pitch
- Conductors: 28 AWG, 7/36 strand tinned copper
- Color: brown, red, orange, yellow, green, blue, violet, gray, white, black (repeat) - tan common
- Cable Thickness: .042" +/- .003"
- Insulation: PVC, flame retardant VW-1
- Flat Laminate: clear PVC, self-extinguishing
- Voltage Rating: 300V
- Current Rating: 1 amp nominal @ 10°C
- Temperature Rating: -20°C to 105°C (-4°F to 221°F)
- UL Style: AWM #20130, CSA available
- # of Programmable Lengths Available: up to ten different twisted pair lengths available
- Cable is provided in flat form. For round bundled configuration, see page 33.

432-2806 Series

- Flat length: 2.5″ ± .125″
- Minimum twisted pair length: 6″ ± .500″

433-2806 Series

NEW!

- Flat length: 1.75″ ± .125″
- Minimum twisted pair length: 4″ ± .500″

Ordering Information:

Overall put-up length: Measure in: feet ☐ meters ☐

Loose twisted pairs provided in flat form

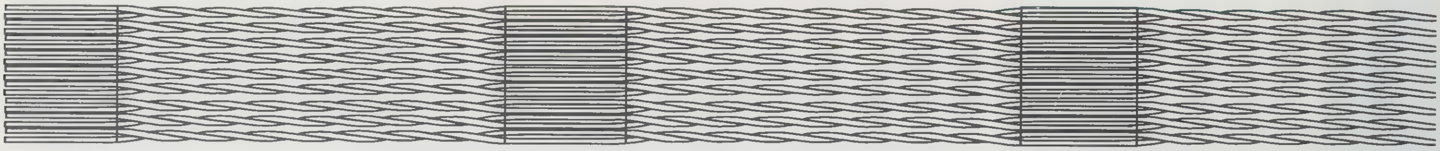
AWG: ______________ # of conductors: ______________

Strand: ______________ (68 maximum)

Spacing: ______________ (34 twisted pair)

Slit length measure in: inches ☐ mm ☐

Indicate each unslit flat and loose pair length in spaces below.
Write in "repeat", if appropriate.



________	________	________	________	________	________
Flat	Loose Pairs	Flat	Loose Pairs	Flat	Loose Pairs

Date ______________________

Factory Part Number (will be assigned)

This request for pricing is made by:

Name ______________________
Title ______________________
Company ______________________
Address ______________________
City ______________ State ______________ Zip ______________
Phone No. (_______) ______________________
Fax No. (_______) ______________________
Comments: ______________________

Copy & Fax to: Cable Marketing Manager

Amphenol
SPECTRA-STRIP

Fax: (203) 281-5872
Phone: (203) 281-3200
(800) 846-6400

Spectra-Strip® Halogen-Free Flame-Retardant Cables

for today's demanding requirements...

Amphenol Spectra-Strip now offers a broad line of halogen-free, flame retardant cables. Halogen-free cable is ideally suited for use in congested areas where ventilation is poor, such as buses, subways, elevators, data processing rooms, ships, aircraft, nuclear facilities, and other enclosed environments...anywhere PVC is forbidden, or where personnel and equipment could be injured by toxic and corrosive gases. (When PVC heats up, or catches fire, toxic and corrosive halogens escape.) Beyond its environmental benefits, halogen-free cable prevents memory degradation due to outgassing PVC corrosion. Protection of components from corrosion is critical in applications requiring high speed computing. Non-PVC cables are a growing trend for government contractors. Spectra-Strip manufacturers its halogen-free cables in many of its popular configurations.

benefits

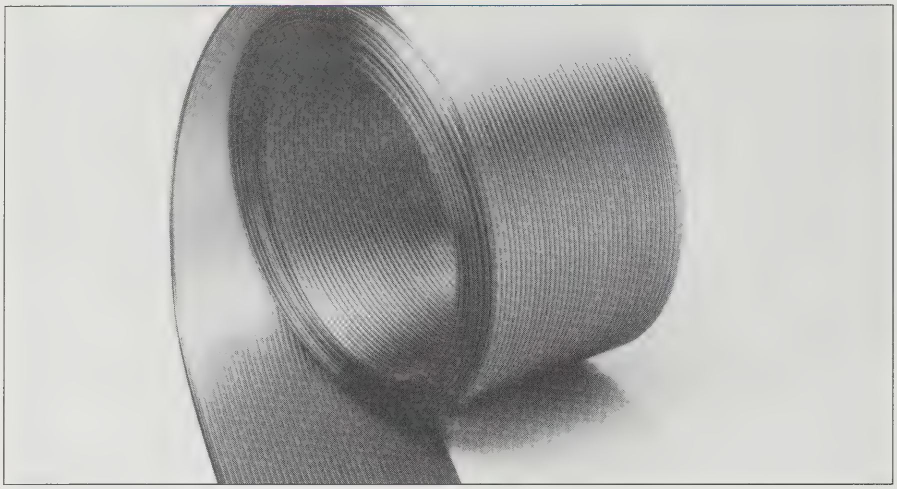
- Wide range of operating temperatures on most configurations: -65°C to +150°C
- Highly flame retardant insulation: limiting oxygen index on most configurations of 46%
- Reduced generation of toxic and corrosive gases during combustion
- Low smoke generation upon combustion
- Popular configurations for a wide variety of applications
- Mass terminable
- Custom capabilities available

general characteristics

Limiting oxygen index: ASTM-D-2863 46%
Halogen content: MIL-C-24643, .01%
Toxicity index: NES 713, 1.0
Optical smoke density: NES 711, 1.0
Acid gas generation: 1.0%
Flammability: VW-1
DESC Drawings: DESC drawings have been initiated for the Spectra-Zip® configuration, and are forthcoming on other configurations.
UL: approved or pending for each configuration

Spectra-Zip
193-2821 series ***Page 38***
Twist 'N' Flat®
132-2821 series ***Page 39***
Loose Pair Twist 'N' Flat®
468-2832 series ***Page 40***
Loose Pair Round Twist 'N' Flat®
168-2832 series ***Page 41***
Spectra-GP® Ground Plane
133-28XX series ***Page 42***

Halogen-Free Zip cable
193-2821 series



description

Halogen-free Zip Cable is designed to reduce the generation of toxic and corrosive gases during combustion. Halogen-free Zip cable can be used in more severe operating environments than standard flat ribbon cables. This cable consists of 28 AWG stranded round conductors on .050" centers with an extruded silicone-polyimide copolymer insulation. This insulation allows the cable to meet UL VW-1 flammability requirements without the use of halogenated flame retardants.

benefits

- Wide range of operating temperatures: -65°C to +150°C
- Highly flame retardant insulation: limiting oxygen index of 46%
- Reduced generation of toxic and corrosive gases during combustion
- Number one conductor stripe for easy polarity identification
- Low smoke generation upon combustion

order information

PART #	# COND	WIDTH A " (mm)	SPAN B " (mm)
193-2821-009	9	.450 (11,43)	.400±.007 (10,16±0,18)
193-2821-010	10	.500 (12,70)	.450±.007 (11,43±0,18)
193-2821-014	14	.700 (17,78)	.650±.007 (16,51±0,18)
193-2821-015	15	.750 (19,05)	.700±.007 (17,78±0,18)
193-2821-016	16	.800 (20,32)	.750±.011 (19,05±0,28)
193-2821-020	20	1.000 (25,40)	.950±.011 (24,13±0,28)
193-2821-024	24	1.200 (30,48)	1.150±.011 (29,21±0,28)
193-2821-025	25	1.250 (31,75)	1.200±.011 (30,48±0,28)
193-2821-026	26	1.300 (33,02)	1.250±.011 (31,75±0,28)
193-2821-034	34	1.700 (43,18)	1.650±.011 (41,91±0,28)
193-2821-036	36	1.800 (45,72)	1.750±.015 (44,45±0,38)
193-2821-037	37	1.850 (47,00)	1.800±0.15 (45,72±0,38)
193-2821-040	40	2.000 (50,80)	1.950±.015 (49,53±0,38)
193-2821-050	50	2.500 (63,50)	2.450±.015 (62,23±0,38)
193-2821-060	60	3.000 (76,20)	2.950±.015 (74,93±0,38)
193-2821-064	64	3.200 (81,28)	3.150±.015 (80,01±0,38)

characteristics

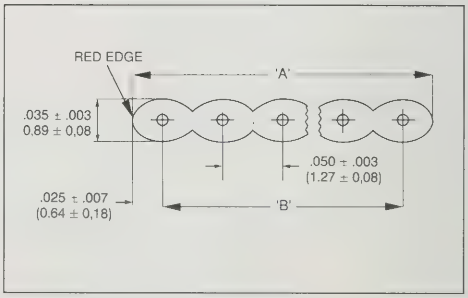
physical

Conductors: 28 AWG, 7/36 strand, tinned copper
Number of conductors: see order information chart
Insulation: .010" wall extruded, silicone-polyimide copolymer
Thickness: .035", ±.003"
Pitch: .050" centers, ±.003"
Color code: amber with number one conductor colored red
Limiting oxygen index: ASTM-D-2863 46%
Halogen content: MIL-C-24643, .01%
Toxicity index: NES 713, 1.0
Optical smoke density: NES 711, 1.0
Acid gas generation: 1.0%
Flammability: VW-1

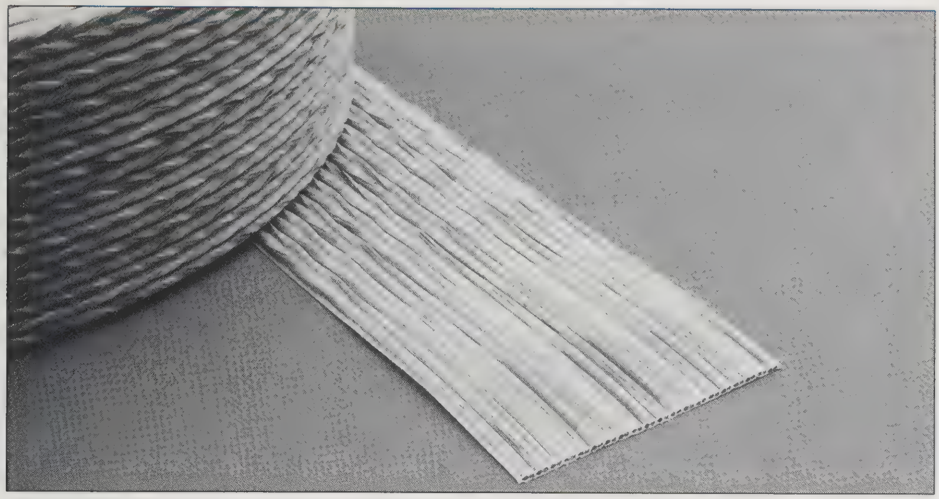
electrical

Voltage: 300 V
Current rating: 1 amp nominal @ 10°C above ambient
Temperature rating: -65°C to +150°C (-85°F to 302°F)
Impedance: 110 ohms nominal
Capacitance: 13.0 pf/ft. (42,7 pf/m) nominal @ 1.0 MHz
Inductance: .17 µh/ft. (,56 µh/m) nominal @ 1.0 MHz
Propagation delay: 1.4 ns/ft. (4,6 ns/m) nominal
Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.
Unbalanced crosstalk: 10' sample, 5 ns rise time with 2 lines driven,
near end = 3.0% nominal
far end = 3.0% nominal
Mode: ground-signal-ground

***UL style:* #20657**
***DESC Drawing:* #91016**



Halogen-Free Twist ‘N’ Flat® planar cable 132-2821 series



description

Halogen-Free Twist ‘N’ Flat cable combines the benefits of mass-terminable flat cable with the electrical performance of twisted pairs, with the added benefits of halogen-free, highly flame retardant cable. This cable is well suited to equipment such as communications and computing applications, within closed environments, or wherever PVC is forbidden. This mass-terminable cable can attain up to 95% labor-savings over discrete strip & crimp termination methods. Twist ‘N’ Flat consists of 18" (45,7 cm) sections of stranded round conductors, twisted into pairs, with 2" (5,1 cm) flat sections of parallel conductors for termination.

benefits

Twist is reversed in adjacent pairs for reduced cross-talk
Wide range of operating temperatures: -25°C to +90°C
Highly flame retardant: limiting oxygen index of 39%
Reduced generation of toxic and corrosive gases during combustion
Low smoke generation upon combustion
Put-up in convenient 100’ rolls
Custom capabilities available:
Custom twist sections (6" to several feet), up to five different twist lengths in same cable, and repeat
Loose laminate sections for access to individual conductors

order information

PART #	# PAIRS	WIDTH A " (mm)	SPAN B " (mm)
132-2821-010	5	.526 (13,36)	.450±.015 (11,43±0,38)
132-2821-014	7	.726 (18,44)	.650±.015 (16,51±0,38)
132-2821-016	8	.826 (20,98)	.750±.015 (19,05±0,38)
132-2821-020	10	1.026 (26,06)	.950±.015 (24,13±0,38)
132-2821-026	13	1.326 (33,68)	1.250±.015 (31,75±0,38)
132-2821-034	17	1.726 (43,84)	1.650±.015 (41,91±0,38)
132-2821-036	18	1.826 (46,38)	1.750±.015 (44,45±0,38)
132-2821-040	20	2.026 (51,46)	1.950±.020 (49,53±0,51)
132-2821-050	25	2.526 (64,16)	2.450±.020 (62,23±0,51)
132-2821-060	30	3.026 (76,86)	2.950±.020 (74,93±0,51)
132-2821-064	32	3.226 (81,94)	3.125±.025 (80,01±0,64)

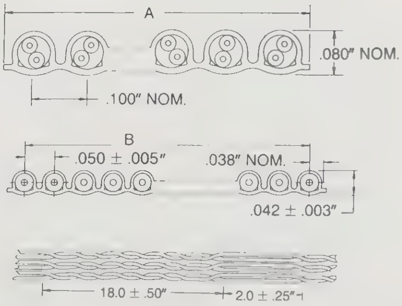
characteristics

physical

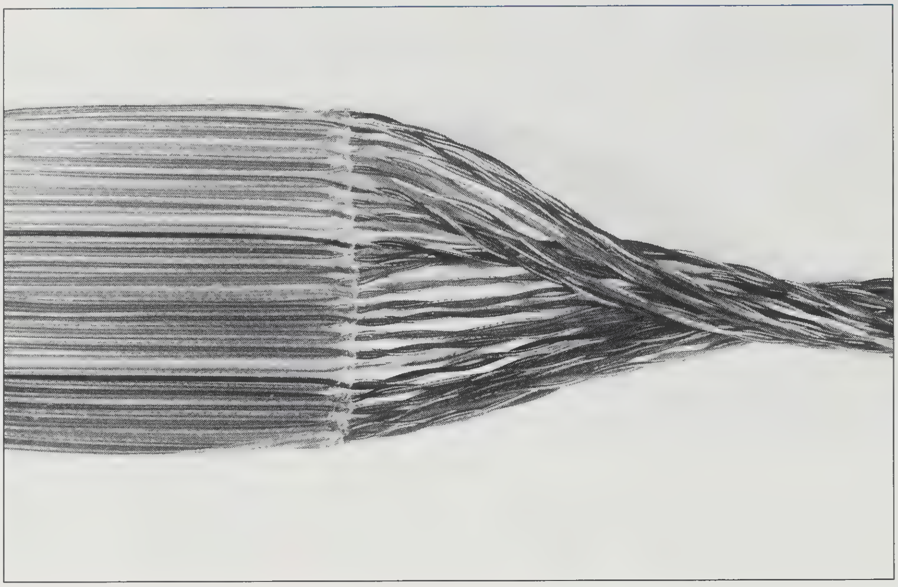
Conductors: 28 AWG, 7/36 strand, tinned copper
Insulation: .010" wall extruded, silicone-polyimide copolymer
Thickness: .042", ±.003" (flat section)
Laminate: Halogen-Free, FR, olefin
Pitch: flats: .050" centers, ± .005", twisted-pairs: .100" (nominal) centers
Color code: Clear amber common, brown, red, orange, yellow, green, blue, violet, gray, white, black, (repeat)
Limiting oxygen index: ASTM-D-2863 39%
Halogen content: MIL-C-24643, .01%
Toxicity index: NES 713, 1.4
Optical smoke density: NES 711, 5.3
Acid gas generation: 1.0%

electrical

Voltage: 300 V
Current rating: 1 amp nominal @ 10°C above ambient
Temperature rating: -25°C to +90°C (-13°F to 194°F)
Impedance: 110 ohms nominal
Capacitance: 12.5 pf/ft. (41,0 pf/m) nominal @ 1.0 MHz
Inductance: .20 µh/ft. (,66 µh/m) nominal @ 1.0 MHz
Propagation delay: 1.6 ns/ft. (5,3 ns/m) nominal
Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.
Unbalanced crosstalk: 10’ sample, 5 ns rise time with 2 lines driven,
near end = 4.2% nominal
far end = 4.0% nominal
Mode: ground-signal



Halogen-Free Loose Pair Twist 'N' Flat® cable 468-2832 series



description

Halogen-free, Loose Pair Twist 'N' Flat Cable combines the electrical characteristics of loose conductor, twisted pair cable with the time and cost savings of mass-terminated cable...with the added bonus of halogen-free materials ideal for use in closed environments. It is designed to reduce the generation of toxic and corrosive gases during combustion. It consists of insulated stranded round conductors, twisted into loose pairs. Every 17.5", the conductors are laminated into parallel .050" center 2.5" sections for mass-termination.

benefits

- Highly flame retardant
- Reduced generation of smoke and toxic and corrosive gases during combustion
- Custom capabilities: laminated sections can be fabricated at custom intervals, from 6" minimum twist length, up to ten different twist lengths in same cable and repeat, to maximum determined by put-up
- Bulk put-up on reel in round form

order information

PART #	# PAIRS	WIDTH A " (mm)	SPAN B " (mm)
468-2832-010	5	.526 (13,36)	.450 (11,43)
468-2832-014	7	.726 (18,44)	.650 (16,51)
468-2832-016	8	.826 (20,98)	.750 (19,05)
468-2832-020	10	1.026 (26,06)	.950 (24,13)
468-2832-026	13	1.326 (33,68)	1.250 (31,75)
468-2832-034	17	1.726 (43,84)	1.650 (41,91)
468-2832-040	20	2.026 (51,46)	1.950 (49,53)
468-2832-050	25	2.526 (64,16)	2.450 (62,23)
468-2832-060	30	3.026 (76,86)	2.950 (74,93)
468-2832-064	32	3.226 (81,94)	3.150 (80,01)

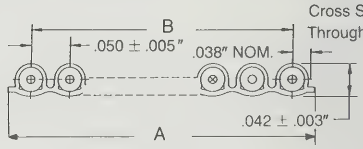
characteristics

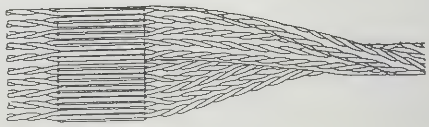
physical

Conductors: 28 AWG, 7/36 strand, tinned copper
Insulation: .010" wall extruded, silicone-polyimide copolymer
Color code: Clear amber common, brown, red, orange, yellow, green, blue, violet, gray, white, black, (repeat)
Flat pitch: .050" centers, ± .005",
Flat laminate: halogen-free polyolefin, white, .005"
Limiting oxygen index: ASTM-D-2863 primary: 46%, laminate: 28%

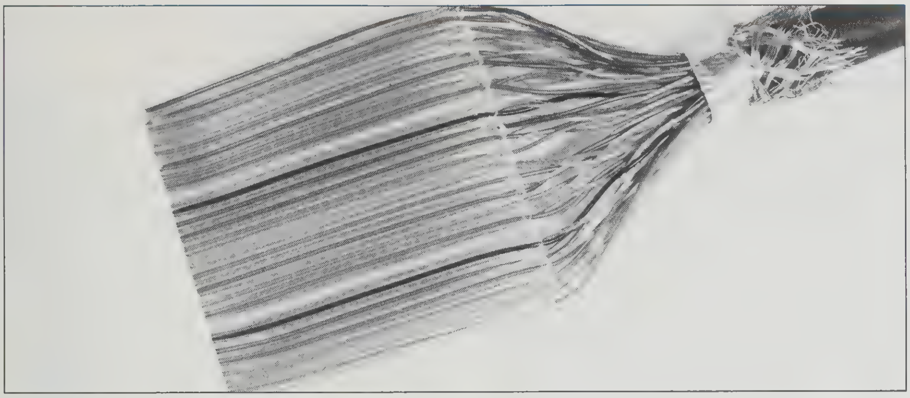
electrical

Voltage: 300 V
Current rating: 1 amp nominal @ 10°C above ambient
Temperature rating:
primary: -65°C to +150°C (-85°F to 302°F)
laminate: -65°C to +80°C (-85°F to +176°F)
Impedance: 115 ohms nominal
Capacitance: 14.0 pf/ft. (45,9 pf/m) nominal @ 1.0 MHz
Inductance: .23 µh/ft. (,75 µh/m) nominal @ 1.0 MHz
Propagation delay: 1.6 ns/ft. (5,3 ns/m) nominal
Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.
Unbalanced crosstalk: 10' sample, 5 ns rise time with 2 lines driven,
near end = 4.0%
far end = 1.6% nominal
Mode: ground-signal
UL: pending





Halogen-Free Loose Pair Round Twist ‘N’ Flat® cable 168-2832 series



description

Halogen-free, Loose Pair Round Twist ‘N’ Flat Cable combines the electrical characteristics of loose conductor, twisted pair cable with the time and cost savings of mass-terminated cable...with the added bonus of halogen-free materials ideal for use in closed environments. It is designed to reduce the generation of toxic and corrosive gases during combustion. It consists of an inner cable of insulated stranded round conductors, twisted into loose pairs. Every 20", the conductors are laminated into parallel .050" center 2.5" sections for mass-termination. It is covered with a foil shield, a tinned-copper braid, and a halogen-free jacket.

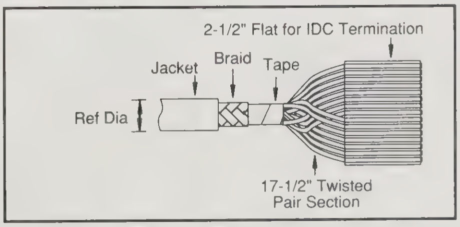
benefits

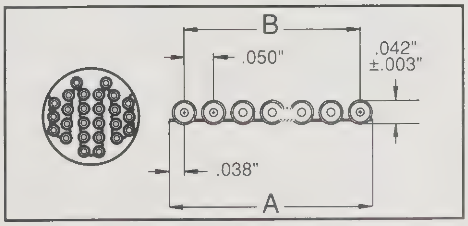
- Highly flame retardant
- Reduced generation of smoke or toxic/corrosive gases during combustion
- Help meet FCC requirements for EMI/RFI suppression
- Custom capabilities: laminated sections can be fabricated at custom intervals, from 6" minimum twist length, to maximum determined by put-up, up to ten different twist lengths in same cable and repeat

order information

PART #	# PAIRS	WIDTH A " (mm)	SPAN B " (mm)	REF. DIA. " X=0 (X=1,2)
168-2832-X10	5	.526 (13,36)	.450 (11,43)	.250 (.220)
168-2832-X14	7	.726 (18,44)	.650 (16,51)	.260 (.230)
168-2832-X16	8	.826 (20,98)	.750 (19,05)	.280 (.250)
168-2832-X20	10	1.026 (26,06)	.950 (24,13)	.290 (.260)
168-2832-X26	13	1.326 (33,68)	1.250 (31,75)	.310 (.280)
168-2832-X34	17	1.726 (43,84)	1.650 (41,91)	.360 (.330)
168-2832-X40	20	2.026 (51,46)	1.950 (49,53)	.390 (.360)
168-2832-X50	25	2.526 (64,16)	2.450 (62,23)	.430 (.400)
168-2832-X60	30	3.026 (76,86)	2.950 (74,93)	.470 (.4040)
168-2832-X64	32	3.226 (81,94)	3.150 (80,01)	.480 (.450)

X = shielding variations: 0 = foil/braid, 1 = foil only, 2 = no shield, jacket only





characteristics

physical

Conductors: 28 AWG, 7/36 strand, tinned copper

Insulation: .010" wall extruded, silicone-polyimide copolymer

Color code: Clear amber common, brown, red, orange, yellow, green, blue, violet, gray, white, black, (repeat)

Flat pitch: .050" centers, ±.005"

Flat laminate: halogen-free polyolefin, white, .005"

Foil shield: Aluminum/polyester

Braid: tinned-copper, with minimum 90% coverage

Jacket: Halogen-free polyolefin, .030" wall

Overall cable length: 8-24": ±.500", 24"-25': ± 1.0", 25'+: ±2.0"

Limiting oxygen index: ASTM-D-2863 primary: 46%, laminate: 28%, jacket: 40%

electrical

(fully shielded version)

Voltage: 300 V

Current rating: 1 amp nominal @ 10°C above ambient

Temperature rating:
primary: -65°C to +150°C (-85°F to 302°F)

Impedance: 75 ohms nominal

Capacitance: 24.0 pf/ft. (78,7 pf/m) nominal @ 1.0 MHz

Inductance: .15 µh/ft. (,49 µh/m) nominal @ 1.0 MHz

Propagation delay: 1.6 ns/ft. (5,3 ns/m) nominal

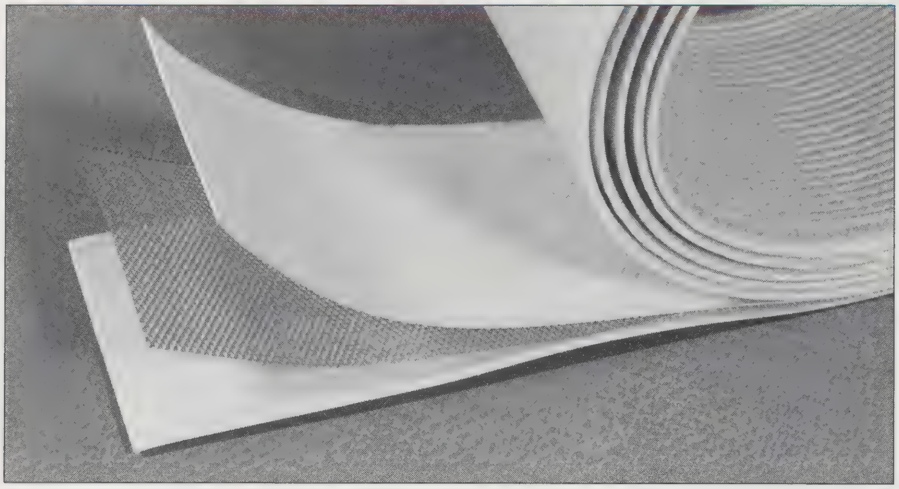
Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.

Unbalanced crosstalk: 10’ sample, 5 ns rise time with 2 lines driven,
near end = 2.3% nominal
far end = 1.3% nominal

Mode: ground-signal, with shield grounded

UL: pending

Halogen-Free Spectra-GP® ground plane planar cable 133-28XX series



description

Halogen-free, Ground Plane Cable is especially well-suited to applications in computer and communications equipment for data transmission and switching, where reduced cross-talk is necessary. It is designed to reduce the generation of toxic and corrosive gases during combustion. Halogen-free ground plane cable consists of stranded uninsulated conductors laminated between flame retardant polyolefin. The ground plane consists of expanded copper mesh, lamininated at a controlled distance from the conductors, and enclosed with an outer layer of flame retardant polyolefin. This cable has a limiting oxygen index of 28%.

benefits

- Wide range of operating temperatures: -65°C to +80°C
- Highly flame retardant insulation: limiting oxygen index of 28%
- Reduced generation of toxic and corrosive gases during combustion
- Integrally laminated ground plane reduces cross-talk
- Low smoke generation upon combustion
- Mass terminable
- Put-up in convenient 100' rolls
- Custom capabilities available:
  Single or multiple drain wires, in any position

order information

PART #	# COND	WIDTH A " (mm)	SPAN B " (mm)
Series 133-28XX without drain wire or polarity stripe			
133-28XX-020	20	1.250 (31,75)	.950±.010 (24,13±0,25)
133-28XX-026	26	1.550 (39,37)	1.250±.010 (31,75±0,25)
133-28XX-034	34	1.950 (49,53)	1.650±.010 (41,91±0,25)
133-28XX-040	40	2.250 (57,15)	1.950±.010 (49,53±0,25)
133-28XX-050	60	3.250 (82,55)	2.950±.010 (74,93±0,25)
Series 133-28XX with drain wire and polarity stripe			
133-28XX-020	20	1.250 (31,75)	.950±.010 (24,13±0,25)
133-28XX-026	26	1.550 (39,37)	1.250±.010 (31,75±0,25)
133-28XX-034	34	1.950 (49,53)	1.650±.010 (41,91±0,25)
133-28XX-040	40	2.250 (57,15)	1.950±.010 (49,53±0,25)
133-28XX-050	60	3.250 (82,55)	2.950±.010 (74,93±0,25)

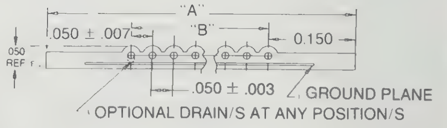
characteristics

physical

Conductors and drain wire: 28 AWG, 7/36 strand, tinned copper
Ground plane: expanded copper mesh
Insulation: .010" wall, halogen-free flame retardant polyolefin
Thickness: .050", ref.
Laminate: halogen-free flame retardant polyolefin
Pitch: .050" centers, ± .003"
Color: white, (with polarity stripe when applicable)
Limiting oxygen index: ASTM-D-2863 28%

electrical

Voltage: 300 V
Current rating: 1 amp nominal @ 10°C above ambient
Temperature rating: -65°C to +80°C (-85°F to 176°F)
Impedance: 55 ohms nominal
Capacitance: 35.0 pf/ft. (114,8 pf/m) nominal @ 1.0 MHz
Inductance: .15 µh/ft. (,49 µh/m) nominal @ 1.0 MHz
Propagation delay: 1.7 ns/ft. (5,6 ns/m) nominal
Insulation resistance: 10^{10} ohms - 10 ft. (3 m) min.
Unbalanced crosstalk: 10' sample, 5 ns rise time with 2 lines driven, near end = 1.5% nominal far end = 4.3% nominal
Mode: ground-signal-ground to shield
UL: pending



Spectra-Strip® flat cable cross reference table

flat cable cross reference table

Description	AWG	Strand	New Spectra-Strip Part Number	Old Spectra-Strip Part Number
Zip, gray	26	1	843-191-2602-0XX	131-2600-0XX
Zip, gray	28	7	● 843-191-2801-1XX	455-240-XX
Zip, gray	28	1	843-191-2802-0XX	455-301-XX
Zip, gray	30	1	843-191-3001-0XX	455-241-XX
Zip, jacketed	28	7	● 843-151-2811-0XX	151-2810-0XX
Zip, jacketed & aluminum mylar	28	7	● 843-151-2831-0XX	151-2830-0XX
Zip, jacketed & copper mesh	28	7	843-151-2821-0XX	
Ground Plane, drain wire	28	7	● 843-133-2801-0XX ● 843-133-2803-0XX	455-276-XX
Ground Plane, without drain wire	28	7	● 843-133-2802-0XX ● 843-133-2804-0XX	455-277-XX
Ground Plane, 3C drain wire	28	7	843-134-2801-0XX	455-318-XX
Ground Plane, jacketed	28	7	843-153-2811-0XX	153-2810-0XX
Ground Plane, jacketed & shielded	28	7	843-153-2831-0XX	153-2830-0XX
Twist 'N' Flat	28	7	● 843-132-2801-0XX	455-248-XX
Twist 'N' Flat, jacketed	28	7	843-152-2811-0XX	152-2810-0XX
Twist 'N' Flat, jacketed & shielded	28	7	843-152-2831-0XX	152-2830-0XX
3C	28	7	● 843-135-2801-0XX	455-044-XX
3C, twisted pairs	26	7	● 843-138-2601-0XX	455-278-XX
Bonded	22	7	● 843-111-2213-0XX	SS-XX22-7B
Bonded	24	7	● 843-111-2413-0XX	SS-XX24-7B
Bonded	26	7	● 843-111-2609-0XX	SS-XX26-7B
Bonded	22	19	● 843-111-2214-0XX	SS-XX22-19B
Bonded	24	19	● 843-111-2414-0XX	SS-XX24-19B

copper conductor data

round conductor

AWG[1]	Stranding	Type Stranding[5]	Diameter		Area		Weight		D.C. Resistance @20°C[2]			
									Tin Coating[4]		Bare[3] or Silver Coating	
			In.	mm	circ. mils	sq. mm	lbs./M′	kg/km	ohms/M′	ohms/km	ohms/M′	ohms/km
32	Solid	—	.0080	.203	64	.0324	.194	.289			162.00	532.00
30	Solid	—	.0100	.254	100	.0507	.303	.451	113.00	371.00	104.00	340.00
30	7/38	Bunched	.0120	.305	112	.0570	.350	.520	92.60	304.00	92.60	303.00
30	26/44	Rope Lay	.0150	.381	104	.0527	.375	.558	—	—	100.00	328.10
28	Solid	—	.0126	.320	159	.0806	.481	.716	70.80	232.00	65.30	214.00
28	7/36	Concentric	.0150	.381	175	.0890	.550	.820	67.50	221.00	59.30	194.00
28	26/42	Bunched	.0157	.399	179	.0906	.567	.844	66.67	218.74	—	—
26	Solid	—	.0159	.404	253	.1280	.765	1.140	44.50	146.00	41.00	135.00
26	7/34	Concentric	.0190	.483	278	.1410	.870	1.290	42.50	139.00	37.30	122.00
26	19/38	Concentric	.0210	.533	304	.1540	.970	1.440	38.90	128.00	34.10	112.00
26	64/44	Rope Lay	.0200	.508	256	.1297	.884	1.315	—	—	40.00	131.24
24	Solid	—	.0201	.511	404	.2050	1.220	1.820	27.20	89.20	25.70	84.20
24	7/32	Concentric	.0240	.610	448	.2270	1.380	2.050	25.70	84.20	23.10	75.90
24	19/36	Concentric	.0250	.635	475	.2410	1.480	2.200	24.90	81.70	21.80	71.60
24	105/44	Rope Lay	.0290	.7366	420	.2128	1.60	2.380	—	—	24.75	81.21
22	Solid	—	.0253	.643	640	.3240	1.940	2.890	16.70	54.80	16.20	53.20
22	7/30	Concentric	.0310	.787	700	.3550	2.190	3.260	16.60	54.40	14.80	48.60
22	19/34	Bunched	.0320	.813	754	.3820	2.350	3.500	15.50	50.80	13.80	45.10
22	105/42	Rope Lay	.0300	.762	651	.3299	2.49	3.705	16.67	54.69	—	—
20	Solid	—	.0320	.813	1,020	.5190	3.100	4.610	10.50	34.40	10.10	33.20
20	7/28	Concentric	.0380	.965	1,111	.5620	3.490	5.190	10.30	33.80	9.33	30.60
20	19/32	Concentric	.0400	1.020	1,216	.6160	3.840	5.710	9.48	31.10	8.53	28.00
20	105/40	Rope Lay	.0400	1.016	1,008	.5108	3.24	4,821	10.53	34.55	—	—
18	Solid	—	.0403	1.020	1,620	.8230	4.920	7.320	6.77	22.20	6.39	21.00
18	7/26	Concentric	.0480	1.220	1,770	.8970	5.550	8.260	6.45	21.20	5.55	19.20
18	19/30	Concentric	.0500	1.270	1,900	.9630	5.950	8.850	6.10	20.00	5.46	17.90
18	105/38	Rope Lay	.0560	1.422	1,596	.8087	5.30	7.886	6.82	22.38	—	—

copper conductor data

Round Conductor (cont.)

AWG[1]	Stranding	Type Stranding[5]	Diameter		Area		Weight		D.C. Resistance @20°C[2]			
									Tin Coating[4]		Bare[3] or Silver Coating	
			in.	mm	circ. mils	sq. mm	lbs./M′	kg/km	ohms/M′	ohms/km	ohms/M′	ohms/km
16	Solid	—	.0508	1.290	2,580	1.31	7.81	11.60	4.47	14.70	4.02	13.20
16	19/29	Bunched	.0570	1.450	2,426	1.23	7.52	11.20	4.82	15.80	4.27	14.00
16	105/36	Rope Lay	.0620	1.574	2,625	1.33	8.20	12.20	4.37	14.34	—	—
14	Solid	—	.0641	1.630	4,100	2.08	12.40	18.50	2.68	8.79	2.52	8.28
14	19/27	Concentric	.0710	1.800	3,831	1.94	12.10	18.01	3.05	10.00	2.71	8.88
14	41/30	Bunched	.0770	1.960	4,100	2.08	12.88	19.17	2.81	9.22	2.53	8.30
12	Solid	—	.0808	2.050	6,530	3.31	19.80	29.50	1.69	5.54	1.59	5.21
12	19/25	Concentric	.0900	2.290	6,088	3.08	19.38	28.84	1.87	6.13	1.70	5.59
12	65/30	Bunched	.0910	2.310	6,500	3.29	20.76	30.89	1.82	5.97	1.60	5.23

(1) For stranded conductors, nearest AWG size is listed.
(2) Typical D.C. resistance values for uninsulated wires. Multiply by 1.04 for typical values after insulation.
(3) Bare annealed copper wire per ASTM B 3.
(4) Tinned annealed copper wire per ASTM B 33.
(5)
- Concentric lay stranded conductor, per ASTM B 8.
- Spectra-Strip bunched stranding is unilay or "smooth bunched" for premium lay, per ASTM B 174.
- Spectra-Strip rope lay stranding (for Ultra-Flex cables) consists of bunch stranded groups cabled into single construction, per ASTM B 172. Characteristics subject to minor variations.

flat conductor

Flat Conductor Sizes Equivalent to Conventional Round Conductors

Required width of flat conductor for given thickness.

Round Cond. AWG	Solid Wire Dia.	Area In.²	Weight lbs/1000 Feet	Feet/ Pound	Rdc at 68°F ohm 1000 feet	Conductor Thickness									
						.001	.002	.003	.004	.005	.006	.007	.008	.009	.010
32	.0080	5.03×10^{-5}	.1913	5160	170.600	.0503	.0252	.0168	.0126	.0101	.00839	.0072			
30	.0100	7.85×10^{-5}	.3042	3300	107.300	.0785	.0392	.0262	.0196	.0157	.01310	.0112	.00972		
28	.0126	.000125	.4837	2080	67.490	.1250	.0626	.0420	.0313	.0250	.02080	.0179	.01560	.0139	.0125
26	.0159	.000199	.7692	1310	42.440	.1990	.0995	.0625	.0500	.0400	.03320	.0285	.02490	.0222	.0199
24	.0201	.000317	1.2230	818	26.690	.3170	.1590	.1060	.0793	.0625	.05280	.0453	.04000	.0352	.0317
22	.0253	.000503	1.9450	516	16.700	.5030	.2520	.1670	.1260	.1000	.08380	.0718	.06380	.0558	.0503
20	.0320	.000804	3.0920	323	10.560	.8040	.4020	.2680	.2010	.1610	.13400	.1150	.10000	.0893	.0800
18	.0403	.001280	4.9170	203	6.640	1.2800	.6410	.4270	.3200	.2560	.21400	.1830	.16000	.1420	.1250
16	.0508	.002030	7.8180	128	4.176	2.0300	1.0200	.6840	.5130	.4100	.34200	.2930	.25600	.2280	.2030

copper conductor data

Current Ratings: All conductors have been assigned current ratings based on the amount of current that will produce certain rises in conductor temperature under specified conditions. The allowable temperature rise above ambient is generally determined by the temperature capacity of the conductor insulation, the desired total temperature of the application — or, other factors.

Heat Dissipation: The heat transfer capability of the conductor insulation will either aid or impede the conduction/convection process by which heat is dissipated. If the designer provides a heat-conducting path, like an adjacent wire or other component normally operating at a significantly lower temperature, the conductor heat will dissipate very efficiently through the insulation. Dissipation to free air through convection is a good method, but in most applications the amount of free air available to each conductor is extremely limited.

Establishing Ratings: A size 26 AWG wire operating in free air at 20°C will increase in temperature about 35°C when carrying 3 amps. Adding the ambient 20°C and the current induced rise 35°C brings the operating temperature of the wire to 55°C — not an extremely high operating temperature — which is considered allowable current-versus temperature for a single standard 26 AWG wire with 80°C PVC insulation.

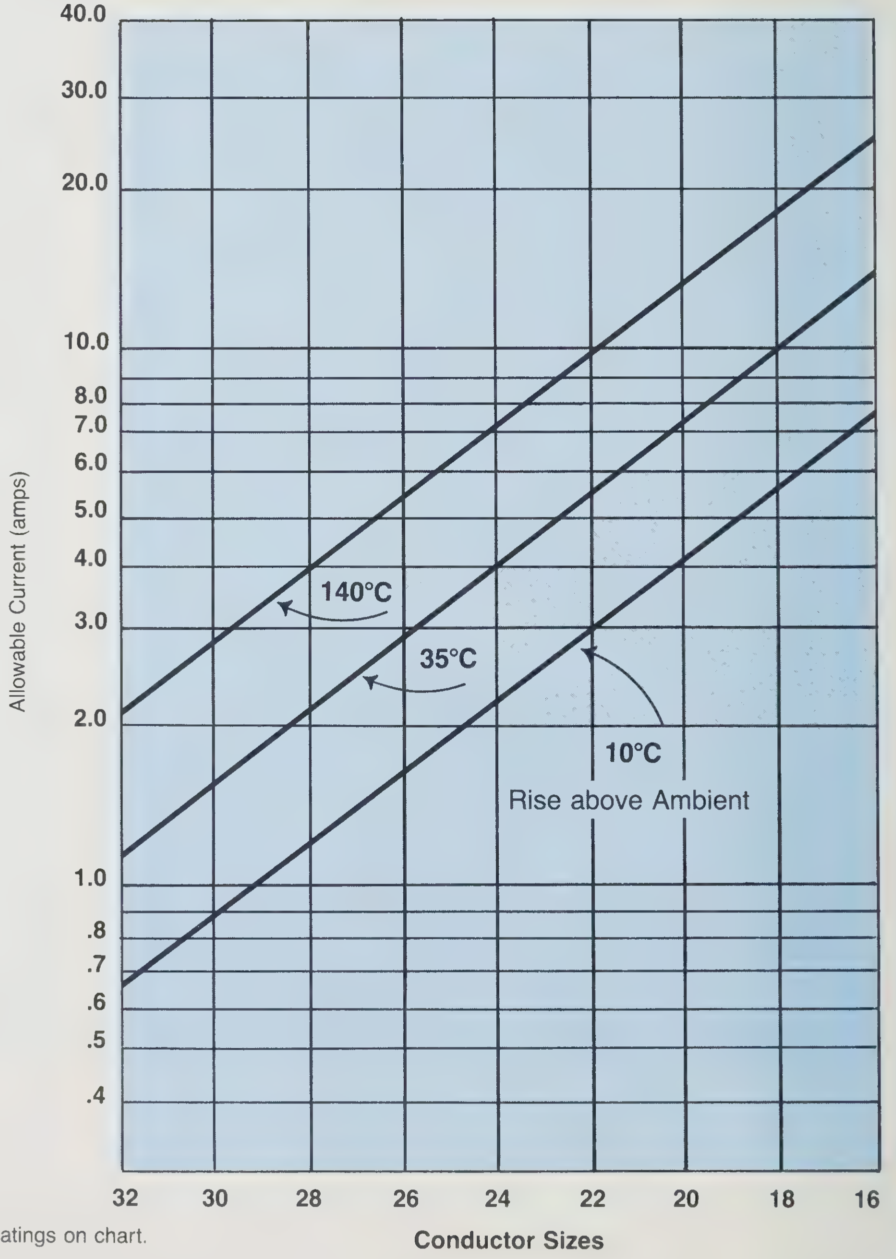
Reference to the current rating chart will show that for a 28 AWG planar cable, the maximum current for a 10°C temperature rise is 1.0 amp; 2.0 amps for a 35°C rise; and 4.0 amps for a 140°C rise. A 10°C temperature rise is recommended in most electronic applications and therefore the current design for #28 AWG should ordinarily be limited to 1.0 amp.

The intent of these arbitrary ratings however is to indicate tolerable temperatures for maximum conductor efficiency when the rating of insulation materials and device total operating temperature will allow. In addition, voltage drop limitations often preclude the full current capacity use in most applications.

Derating: The optimum ratings are those which will produce tolerable temperature rises; in practice, they are usually derated, because in designing a circuit the engineer does not normally take into account other factors influencing wire temperature beyond the actual passage of current. What the designer knows least about, in advance, is the precise mechanical interrelationship that an individual circuit wire will experience when placed in the final assembly. Because of this, he derates the conductor as a safety factor.

current ratings

for Laminated and Bonded Planar Cables, or Extruded Cables, in Still Air



Note: No derating or safety factors applied to current ratings on chart.

crosstalk

crosstalk in planar cables

Crosstalk is the electrical disturbance caused in a quiet signal line when an adjacent line (or lines) is activated. For example, crosstalk occurs in common telephone signals (where you hear faint voices in the background or static buzzing) when weather conditions are right to induce a voltage gradient in a quiet line. In computer applications, excessive crosstalk can trigger sensitive logic circuits, usually a result of magnetic coupling of signals from other lines or sources (inductive or capacitive or a combination of both).

The magnitude of crosstalk on a given line is affected by:

1. Rise time of pulse in the signal line.
2. Geometry of signals and grounds.
3. Termination impedance of cable to circuitry.
4. Cable length.

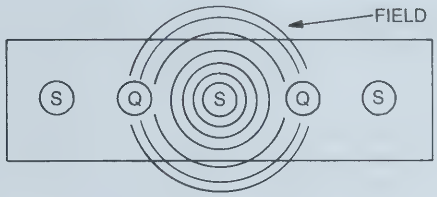
crosstalk tests

The most basic crosstalk test consists of driving one signal line in a cable and measuring the crosstalk on the adjacent signal line. Measurements are usually taken at the "near" or "backward" end (input end) and at the "far" or "forward" end (output end).

When a quiet line is probed at the driven or input end of the system, the voltage pickup seen is a pulse with the same rise time as the driving pulse, with a lower DC value, and a duration of twice the delay time of the transmission line. This is called Near End or Backwards Crosstalk.

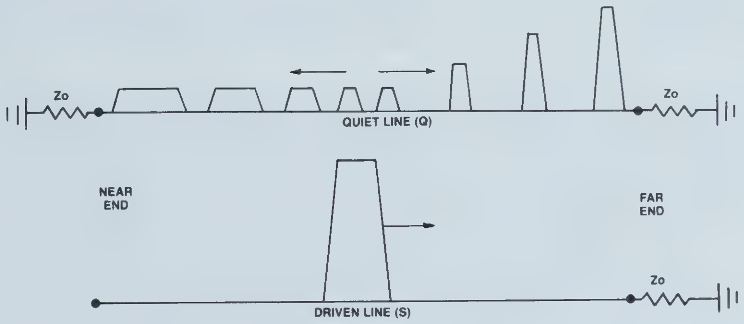
When the quiet line is probed at the termination or output end, the pickup is a spike of opposite polarity from the driving line, and a time duration equal to about twice the output rise time. This is termed Far End or Forward Crosstalk.

While Near End Crosstalk is almost directly proportional to input peak voltage, Far End Crosstalk increases with cable length and faster pulse rise times.



S — Driven or Signal Line
Q — Quiet or Disturbed Line

Capacitive and inductive coupling between the driven line and the quiet line causing unwanted signals in the quiet line.



Rise Time

The faster the pulse rises, the greater the far-end crosstalk. It is measured in nanoseconds (10^{-9}). See curves of rise time vs. crosstalk for various planar cables.

Configuration

Crosstalk can be reduced by adding ground lines between signal lines, using twisted pairs, adding a ground plane below conductors, increasing conductor spacing or various combinations of these techniques.

Termination Impedance

Properly terminating a transmission line will reduce crosstalk, and can also reduce pulse reflections on the driven lines.

Cable Length:

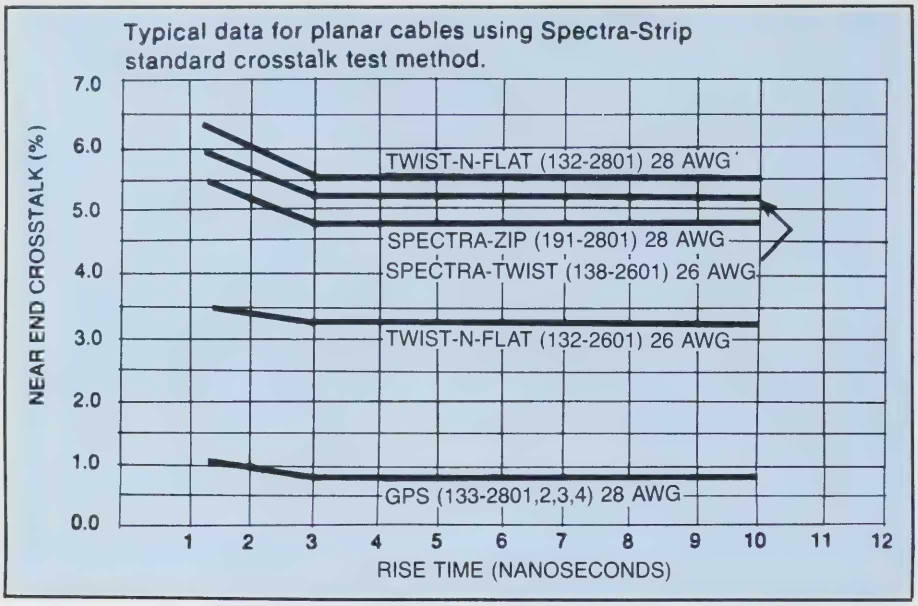
Crosstalk increases as the signal line length increases.

Stacked Crosstalk

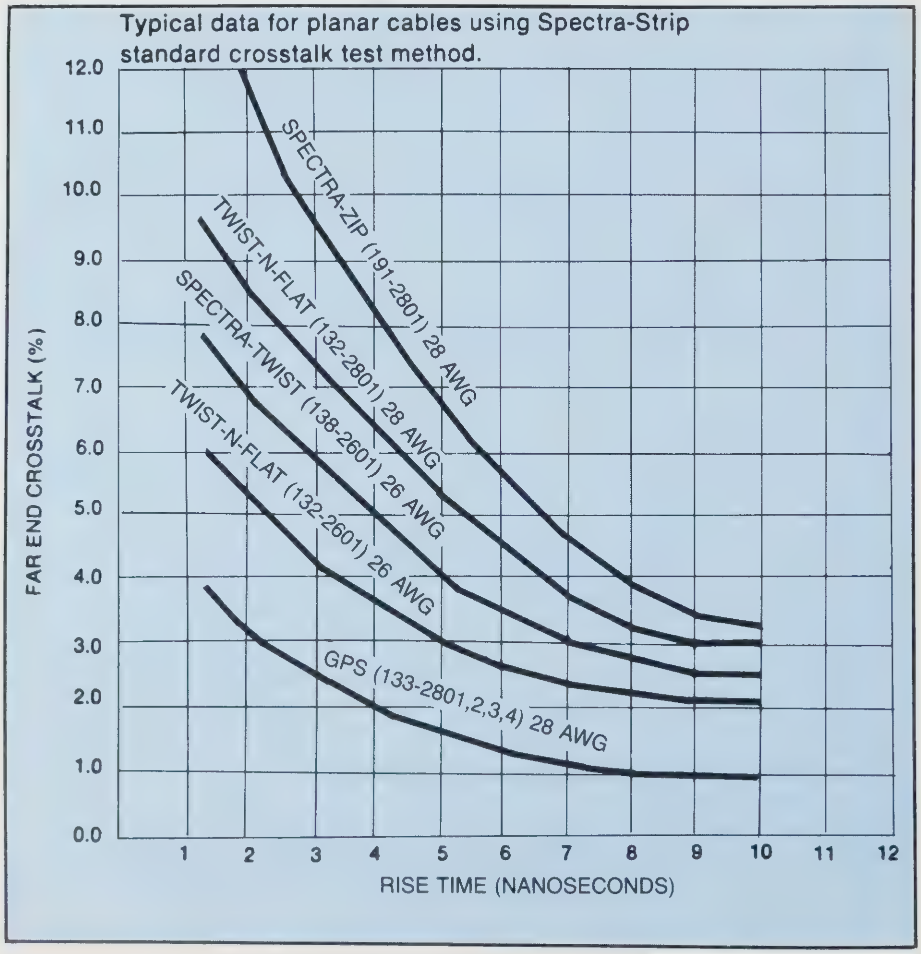
The far and near end crosstalk when measured between layers of cable. It is best reduced by inserting dielectric spacers between layers.

crosstalk

Near End (Backward) Crosstalk vs. Rise Time

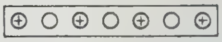
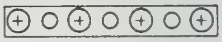
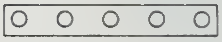
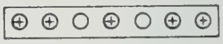
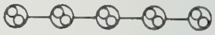
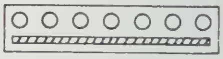
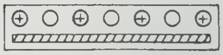


Far End (Forward) Crosstalk vs. Rise Time



reducing crosstalk

1. Reduce signal rise time. (see curves).
2. Reduce length of cable or signal line.
3. Utilize cable configurations:

		Relative Far End Crosstalk
Add Alternate Ground Wires		10
Increase Ground Wire Size		9
Increase Pitch (Spacing)		7
Add Two Ground Wires		6
Twisted Pairs		6
Add Ground Plane		3
Add Ground Plane and Ground Wires		2

Spectra-Strip crosstalk standards

Spectra-Strip crosstalk tests utilize a standard cable length of 10 feet. Two driven lines and the quiet line (center) are terminated in their characteristic impedance and other lines left open circuit.

Typical data is compiled over a range of rise times with five (5) nanoseconds selected as the standard. Crosstalk in the quiet line is expressed as the percentage (%) of driven signal.

standard agencies

wire and cable

Wire and cable for the electrical and electronic industries are manufactured to meet specifications written by several sources. Chief among these sources are Underwriters Laboratories, Inc. and Canadian Standards Association providing specifications for commercial and industrial applications plus various agencies of the Department of Defense which write the specifications for military applications.

Underwriters Laboratories, inc.

Underwriters Laboratories, Inc. (UL) is an independent, nonprofit organization which offers testing, inspection, and listing services for a wide range of components, materials and equipment. The bulk of UL activity today still centers on electrical and electronic products.

All standard products offered by Spectra-Strip are produced using UL approved materials and most are listed to specific styles based on their applications and construction. New products or specials either fall under existing styles or can be submitted to UL for development of a new applicable style.

Individual manufacturers receive UL file numbers for each product type covered by a UL standard. For Spectra-Strip products in this catalog, applicable file numbers are:

Appliance Wiring Materials	E51301
Power-limited Circuit Cables	E116273
Communications Cables	E140435

Canadian Standards Association

The Canadian Standards Association (CSA) is the counterpart to UL in Canada. CSA is also an independent, nonprofit organization providing testing, examination, and certification services for a wide range of products used in Canada. While not exactly the same as UL, CSA standards are similar to those given by UL and are developed through much the same procedures. Individual file numbers for each type of wire and cable manufactured are also given to manufacturers. Examples of Spectra-Strip file numbers are:

Appliance Wire and Premises Communication Cable	LL31941

standard agencies

laminated planar cables

Spectra-Strip Part Number	Cable Type	Recognition		Laminate Mat'l.	UL/CSA Rating		Additional Information
		UL Style Number	CSA Designation		Temp. °C	Volt	
135-2801	Color Coded	2697	I A	PVC	80	300	CSA requires cable to be printed. USE: Internal wiring of electronic equipment.
135-2601							
135-2401							
135-2602							
135-2402							
135-2603							
135-2604							
135-2403							
135-2201		20130			105	300	
132-2801 132-2601	Twist 'N' Flat	2697	I A	PVC	80	300	CSA requires cable bo be printed. USE: Internal wiring of electronic equipment.
138-2601	Twisted Pair	20126	I A	PVG	80	300	CSA requires cable to be printed. USE: Internal wiring of electronic equipment.
138-2801							
138-2401							
139-2601		20130			105	300	
134-2801	Ground Plane	2638	I A	PVC	80	300	CSA requires cable to be printed. USE: Internal wiring of electronic equipment.
144-2601 144-2401	Gray PVC	2651	—	PVC	105	300	Uninsulated wires. USE: Internal wiring Class 2 circuits.
191-2801 191-3001 191-2802 191-2601 191-2602	Spectra-Zip	2651	I A	PVC Extruded	105	300	Uninsulated wires, tinned or bare copper. USE: Internal wiring of electronic equipment. CSA requires cable to be printed.
133-2801 133-2802 133-2803 133-2804	Ground Plane	2682	I A	PVC	105	300	Uninsulated wires, tinned or bare copper. USE: Internal wiring of electronic equipment. CSA requires cable to be printed.

Dimensions and characteristics subject to change without notice.

standard agencies

bonded ribbon cable — PVC

UL Listings		Temp. Rating (°C)	Voltage Rating	Additional Information
Cable Style No.	Conductor[2] Style No.			
2648	1429	80	150	IPVC (BXL)[4]
2444	1095	80	300	------
2476[1]	1061	80	300	SR-PVC
2555[1]	1007	80	300	PVC
2473[1]	1011	80	600	PVC
2500[1]	1013	90	600	PVC
2647	1430	105	300	IPVC (CXL)[4]
2474[1]	1015	105	600	PVC
2649	1431	105	600	IPVC (DXL)[4]
2697[1]	Specified[3]	80	300	Cable can be comprised of any conductor complying with UL subject 758.
2698	Specified[3]	80	600	" " "
2695	Specified[3]	90	300	" " "
2696	Specified[3]	90	600	" " "
2693	Specified[3]	105	300	" " "
2694	Specified[3]	105	600	" " "
20126	SR-PVC	80	300	" " "

(1) Also CSA Certified — must be surface printed.
(2) Conductor UL Style No. determines cable style no.
(3) Specified refers to conductor style no. required by user.
(4) IPVC — Irradiated Polyvinyl Chloride.

Mil-W-16878D insulation summary table

Insul. Type	Insulation Material	Temp. Rating (°C)	Voltage Rating
B	PVC	105	600
C	PVC	105	1000
D	PVC	105	3000
E	TFE (Teflon)	200	600
EE	TFE (Teflon)	200	1000
ET	TFE (Teflon)	200	250
F	Silicone	200	600
FF	Silicone	200	1000
FFW	Silicone	200	1000
J	Polyethylene	75	600
K	FEP (Teflon)	200	600
KK	FEP (Teflon)	200	1000
KT	FEP (Teflon)	200	250

standard agencies

hook-up wire, PVC insulation

Listings					
UL Style Number	CSA Recognition	Temp. Rating (°C)	Voltage Rating	Thickness (Inches)	Wall Additional Information
1568	—	80	150	.009	Class 2 Circuits
1007	PVC	80	300	.016	——
1061	SR-PVC	80	300	.009	Semi-Rigid Compound
1095	—	80	300	.012	——
1195	SR-PVC	80	300	.015	Semi-Rigid Compound
1011	PVC	80	600	.031	CSA Rating 90°C
1013	PVC	90	600	.031	——
1569	PVC	105	300	.016	——
1015	PVC	105	600	.031	——
1731	—	105	300	.010	——

UL/CSA summary

Cable	Std. P/N (CSA P/N)	UL/CSA
Spectra-Guard	151-2811-XXX 151-2831-XXX (For CSA Use 151-2811-1XX) (For CSA Use 151-2831-1XX)	UL Listed CL2 CSA AWM I/II 105C 300V FT-1
Spectra-Zip	191-2801-XXX (For CSA Use 191-2801-1XX)	UL Style 2651 CSA AWM I 105C 300V FT-1
3C	135-2801-XXX (For CSA Use 135-2801-2XX)	UL Style 2697 CSA AWM I 80C 300V FT-1
Twist'N'Flat	132-2801-XXX (For CSA Use 132-2801-1XX)	UL Style 2697 CSA AWM I 80C 300V FT-1
Spectra-Twist	138-2601-XXX (For CSA Use 138-2601-1XX)	UL Style 20126 CSA AWM I 80C 300V FT-1
Spectra-GP	133-280X-XXX (For CSA Use 133-280X-1XX)	UL Style 2682 CSA AWM I 105C 300V FT-1
Spectra-Bond	111-XXXX-XXX (For CSA Use 111-XXXX-3XX)	UL Style 2697 CSA AWM I 80C 300V FT-1 CSA AWM I 80C 300V FT-1
Spectra-Flex	112-XXXX-XXX (For CSA Use 112-XXXX-3XX)	UL Style 2697 CSA AWM I 80C 300V FT-1
Round'N'Flat Round Twist'N' Flat	159-XXXX-XXX 169-XXXX-XXX	UL Listed CL2 CSA AWM I/II 105C 300V FT-1
SCSI	167-XXXX-XXX	UL Listed CL2 CSA AWM I/II 75C 300V FT-4

dictionary of electronic and flat cable terms

A

a: Abbreviation for ampere.

abrasion resistance: Ability to resist surface wear.

abrasive stripper: A motorized device for removing flat cable insulation by means of one or two abrasive wheels that melt the insulation by friction and brush it away from the conductor.

AC: Abbreviation for alternating current.

af: Abbreviation for audio frequency.

alternating current: Electric current that reverses its direction periodically.

ambient: The conditions existing at an operating location prior to and during energizing of equipment. (Examples: ambient temperature or noise.)

ampere: The unit expressing the rate of flow of electrical current. Designated as the amount of current that occurs when one volt potential is applied across one ohm of resistance.

ampacity: Current handling capability.

amplitude: The maximum value of a periodically varying wave form.

anneal: Relief of mechanical stress through heat and gradual cooling. Annealing copper renders it less brittle.

attenuation: In a cable system, attenuation is the loss in signal due to the cable. Generally attenuation is expressed in dB per unit length.

audio: Sounds within the range of human hearing. The term audio is also used to describe devices which are designed to operate within this range.

audio frequency: The range of frequencies lying within the range of human hearing; approximately 20 to 20,000 Hz.

AWG: American Wire Gauge. A wire diameter specification. The lower the AWG number — the larger the wire.

AWM: Designation for appliance wiring material.

B

backshell: Metal housing providing continuity of shield through IDC connectors.

balanced line: A cable having two identical conductors with the same electromagnetic characteristics in relation to other conductors and to ground.

bandwidth: The difference between the upper and lower limits of a given band of frequencies expressed in Hertz.

bond strength: Amount of adhesion between bonded surface, e.g. in bonded ribbon cable.

bonded cable: Round insulated conductors or cables that are placed side by side and chemically joined in a single plane.

braid: A group of textile or metallic filaments interwoven to form a tubular structure which may be applied around one or more insulated wires, or flattened to form a strap.

breakout: The point at which a conductor or conductors are separated from a multi-conductor cable to complete circuits at various points along the main cable.

buff stripping: See abrasive stripper.

C

C: Symbol for capacitance and centigrade.

cable assembly: A completed cable and its associated hardware ready to install, including its required terminations, potting, shielding, integral mounting provisions or other component parts as appropriate.

capacitance: The ability of a dielectric material between conductors to store electricity, when a difference of potential exists between the conductors. The unit of measurement is the farad.

capacitive crosstalk: Cable crosstalk or interference resulting from the coupling of the electrostatic field of one conductor upon one or more others.

center-to-center spacing: See pitch.

characteristic impedance: The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency. It is a combination of resistance, capacitance and inductance.

circuit: A system of conductive mediums designed to pass an electric current.

circuit tracing: Locating or identifying a specific conductor path.

cold flow: The quality or state of a material that changes shape or thickness under sustained pressure.

color code: A color system for wire and circuit identification.

conductivity: The ability of a material to allow electrons to flow, measured by the current per unit voltage applied. The reciprocal of resistivity (conductance).

conductor: A material suitable for carrying electric current.

controlled impedance cable: A package of two or more insulated conductors where impedance measurements between respective conductors is kept essentially constant throughout the entire length.

coupling: The transfer of energy between two or more cables or components of a circuit.

CPS: Abbreviation for cycles per second or Hertz.

cross-linked: Additional bonding of molecules between any coupling either by electron bombardment or chemical means. Generally results in improved properties such as crush resistance, abrasion resistance and heat resistance.

crosstalk: A type of interference caused by audio frequencies from one line being coupled into adjacent lines. This term is loosely used also to include coupling at higher frequencies.

CSA: Abbreviation for Canadian Standard Association. Underwriters Laboratories counterpart in Canada.

current: The rate of transfer of electricity. Unit is the ampere which represents the flow of energy which occurs when a one-volt potential is applied across one ohm of resistance.

current carrying capacity: The maximum current a conductor can carry without being heated beyond a safe limit.

cut-through resistance: The ability of a material to withstand a mechanical pressure without damage.

D

daisy chain: A cable assembly with three or more termination areas.

dB: Abbreviation for decibel. A unit for comparing the ratio of two levels. One dB is equal to:

10 times the $\log_{10}$ of the power ratio (P_1/P_2)
20 times the $\log_{10}$ of the voltage ratio (E_1/E_2)
20 times the $\log_{10}$ of the current ratio (I_1/I_2)

DC: Abbreviation for direct current.

derating factor: A multiplier used to reduce the current carrying capacity of conductors in more adverse environments.

dielectric: An insulating medium with good electronic properties. Usually found in transmission cables.

dielectric constant: Also called permittivity. The property of a dielectric which determines the amount of electrostatic energy that can be stored by the material when a given voltage is applied to it.

dielectric strength: The voltage an insulation can withstand before breaking down. Usually expressed in volts per mil thickness.

dielectric withstand voltage: The voltage that an insulating material can withstand before breakdown occurs.

DIP: Dual-In-Line package consisting of rectangular integrated circuit with leads on the two long sides. Usually mates with a DIP socket mounted on the P/C board.

distortion: An undesired change in wave form as the signal passes through a device or cable.

disturbed conductor: A conductor that receives energy generated by the field of another conductor or an external source, e.g. the quiet line.

drain wire: An uninsulated wire in contact with a shield throughout its length and used for terminating the shield.

E

E: Also v, the abbreviation for voltage or potential.

earth: British terminology for zero-reference ground.

dictionary of electronic and flat cable terms

EMI: Abbreviation for electromagnetic interference.

external interference: The effects of any electrical waves or fields which cause signals other than the desired signal.

F

f: The abbreviation for frequency.

farad: The unit of capacitance that will store one coulomb of electrical charge when one volt of electrical pressure is applied.

FCFC: Abbreviation for flat conductor flat cable.

FEP: Fluorinated ethylene propylene, the meltable, i.e. extrudable, version of “Teflon™”* insulation.

flat cable: Any cable with two smooth or corrugated but essentially flat surfaces, made of single wires or twisted pairs bonded or laminated together in one plane.

flat conductor: A conductor with a width-to-thickness ratio of arbitrarily 5 to 1 or greater.

flat conductor cable: A cable with a plurality of flat conductors.

flex life: The ability of a cable to bend many times before breaking.

flexibility: The ability of a cable to bend in a short radius.

frequency: The number of times a periodic action occurs in a unit of time, i.e. cycles per second.

frequency response: The characteristic of a device denoting the range of frequencies over which it may be used effectively.

G

gang strip: Stripping all or several conductors simultaneously.

gnd: Abbreviation for ground.

ground: An electrical connection to the earth, generally through a ground rod. Also a common return to a point of zero potential, such as the metal chassis in radio equipment.

ground conductor: A conductor in a transmission cable or line that is grounded.

gold flash: A light gold plating.

H

H: Unit symbol for henry.

harness: A flat cable or group of cables, usually with many breakouts with the wire ends prepared for termination or terminated to connectors and ready to install.

henry: The unit of inductance that will produce a voltage drop of one volt when the current changes at the rate of one ampere per second.

Hertz: The unit of frequency. One Hertz is one cycle per second.

HF: High frequency.

high frequency: The band from 3 to 30 MHz in the radio frequency spectrum, as designated by the Federal Communications Commission.

hipot: Voltage breakdown test of a dielectric. Hipot is the short form of the words “high potential”.

hook-up wire: Insulated wire used for low current, low voltage (under 1000 V) applications internally within enclosed electronic equipment.

hum: A term used to describe the 60 or 120 Hz sound present in the sound of some communications equipment. Usually hum is the result of undesired coupling to a 60 Hz. source.

Hz: Abbreviation for Hertz.

I

I: Symbol for current.

IDC: Abbreviation for Insulation Displacement Contact.

impedance: The total opposition a circuit, cable, or component offers to alternating current. It includes both resistance and reactance and is generally expressed in ohms.

impedance, high: Generally considered the area of 600 ohms or higher.

impedance, low: Generally considered the area of 1 through 600 ohms.

impedance match: A condition whereby the impedance of a particular circuit, cable, or component is the same as the impedance of the circuit, cable, or device to which it is connected.

impulse: See pulse.

index edge: Edge of a flat cable from which measurements are made, normally marked with a stripe.

inductance: A property of a conductor circuit which resists a change in current. It causes current changes to lag behind voltage changes and is measured in henrys.

induction: The phenomenon of a voltage, magnetic field, or electrostatic charge being produced in an object by lines of force from the source of such fields.

inductive crosstalk: Crosstalk resulting from the coupling of the electromagnetic field of one conductor upon another.

input: A signal (or power) which is applied to a piece of electric apparatus, or the terminals on the apparatus to which a signal or power is applied.

insertion loss: A measure of the attenuation of a device or cable by determining the output of a system before and after the device is inserted into the system.

insulation: Material having a high resistance to the flow of electric current, to prevent leakage of current from a conductor.

insulation displacement connector — (IDC): A mass termination connector for flat cable with contacts that displace the conductor insulation to complete termination.

interference: Disturbances of an electrical or electromagnetic nature that introduce undesirable responses into other electronic equipment.

I/O Interconnection: Input/Output interface to the “outside world.”

irradiation: The exposure of insulation to high energy emissions to favorably alter (cross-link) the molecular structure.

isolation: The ability of a circuit, cable, or component to reject interference, usually expressed in dB.

J

jacket: Outer insulation of the cable when there are two or more layers of measurably different insulating materials.

jumper: A short length of conductor or flat cable used to make a connection between terminals or around a break in a circuit, or between circuit boards.

K

kilo: Prefix meaning thousand.

kilohertz: (KHz) Thousand hertz i.e., 15 KHz = 15,000 Hz.

kilohms: (KΩ) Thousand ohms i.e., 100 KΩ = 100,000 ohms.

kilowatts: (Kw) Thousand watts i.e., 1 Kw = 1,000 watts.

L

L: Symbol for inductance.

laminated cable: Insulated or uninsulated wires which are encapsulated by two sheets of laminate material to maintain a predetermined pitch.

laminate: Two or more layers of materials bonded or laminated together.

lay: Pertaining to wire and cable, the axial distance required for one cabled conductor or conductor strand to complete one revolution about the axis around which it is cabled.

lay direction: The twist in the cable as indicated by the top strands while looking along the axis of the cable away from the observer. Described as “right hand” or “left hand” lay.

lead dress: The placement or routing of wiring and component leads in an electrical circuit.

leakage: The undesirable passage of current over the surface of or through an insulator.

level: A measure of the difference between a quantity or value and an established reference.

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*Teflon™ is a trademark of E.I. duPont & Co.

dictionary of electronic and flat cable terms

lf: Abbreviation for low frequency.

line drop: A voltage loss occurring between any two points in a power or transmission line. Such loss is due to the impedance or leakage of the line.

line voltage: The value of potential existing on a supply or power line.

load: A device that consumes or converts the power delivered by another device.

longitudinal shield: A tape or foil shield applied lengthwise to a core or cable.

loss: The portion of energy applied to a system that is dissipated and performs no useful work.

low frequency: A band of frequencies extending from 30 to 300 KHz in the radio spectrum, designated by the Federal Communications Commission.

M

M: Abbreviation for mega or 1 million.

m: Abbreviation for milli or one-thousandth.

ma: Abbreviation for milliampere (one-thousandth of an ampere) i.e., 1 ma = .001 ampere.

Mc: Former abbreviation for megacycle or 1 million cycles.

mega: Prefix meaning million.

mFd: Abbreviation for millifarad or 1-thousandth of a farad.

MHz: Megahertz (one million cycles per second) i.e., 10 MHz = 10,000,000 Hz.

micro: Prefix meaning 1-millionth.

microfarad: One-millionth of a farad (uf, ufd, mf, and mfd are common abbreviations) i.e., 5 uf = .000005 farads.

micromicrofarad: One-millionth of a microfarad (uuf, uufd, mmf, mmfd are common abbreviations). Also known as a picofarad (pf or pFd) i.e., 5 pf = .000000000005 farads.

microphonics: Noise caused by mechanical excitation of a system component. In a single conductor microphone cable, for example, microphonics can be caused by the shield rubbing against the dielectric, as the cable flexed.

mil: A unit of length equal to one-thousandth of an inch.

milli: Prefix meaning one-thousandth, i.e., 5 millinches = .005 inches.

multiconductor: More than one conductor within a single cable construction.

mv: Millivolt (one-thousandth of a volt).

mw: Milliwatt (one-thousandth of a watt).

N

n: Symbol for nano (1 nanosecond = .000000001 seconds).

nano: Prefix meaning 10^{-9} (see nanosecond for example).

nanosecond: 10^{-9} seconds (1 nanosecond = .000000001 seconds. For example, there are as many nanoseconds in one second as there are seconds in 31.71 years.) Term is used in describing the rise time of a signal, and time delay.

noise: In a cable or circuit, any extraneous sounds or signals which tend to interfere with the sound or signal normally present in or passing through the system.

notch: The removal of the web section between conductors of a flat cable to aid in stripping, slitting, and termination.

O

ohm: The electrical unit of resistance. The value of resistance through which a potential difference of one volt will maintain a current of one ampere.

Ohm's Law: Stated $E = IR$, $I = E/R$, or $R = E/I$. This formula is used to determine voltage (E), current (I) or resistance (R) when the other two terms are known. For example, if you have a 10 volt source and the resistance is 5 ohms, then current $= I = E/R = 10/5 = 2$ amperes.

output: The useful power or signal delivered by a circuit or device.

overcast: Conductor produced by applying a coating of tin over tin-plated stranded conductors holding the strands together yielding easier soldering and preventing fraying of strands.

P

p: The symbol for pico (10^{-12} or one-millionth of a millionth).

parallel circuit: A circuit in which the identical voltage is presented to all components, and the current divides around the components.

patch cord: A flexible piece of electrical cord terminated at both ends with plugs, used for interconnecting circuits or a patch board.

peak: The maximum instantaneous value of a varying current or voltage.

peel strength: The force necessary to separate two adjacent conductors of a bonded or laminated flat cable.

pickup: Any device which is capable of transforming a measurable quantity of intelligence (such as sound) into relative electrical signals, e.g., a microphone.

pico: Prefix meaning one-millionth of one-millionth (10^{-12}).

picofarad: One-millionth of one-millionth of a farad. A micromicrofarad (abbreviated pfd).

pitch: Nominal distance between adjacent conductors within a cable, expressed in thousandths of an inch or millimeters.

plastic: High polymeric substances capable of flowing under heat and pressure.

plasticizer: A chemical added to plastics to make them softer and more flexible.

plug: A male housing with male or female contacts.

point-to-point wiring: Wiring that consists of continuous conductors terminated at each end to circuit destination.

polarization: The orientation of a flat cable or a rectangular connector, e.g., for gray flat cable, the colored edge indicating the number one conductor.

polyvinyl chloride (PVC, Vinyl): A general purpose thermoplastic used for wire and cable insulations and jackets.

position coding: Identification of conductors by their location, possible only when conductors are located in assigned positions with relation to each other throughout the entire length of a cable.

potting: Sealing by filling with a substance to exclude moisture.

power: The amount of work per unit of time. Usually expressed in watts and is equal to I^2R or EI.

power cable: Cable designed to carry a current of one ampere or more per conductor.

power loss: The difference between the total power delivered to a circuit, cable, or device, and the power delivered by that device to a load.

power ratio: The ratio of power appearing at the load, to the input power. Expressed in dB, it is equal to $10 \log_{10} (P_2/P_1)$, where P_1 is the input power and P_2 is the power at the load.

propagation delay: The time delay between input and output of a signal usually measured in nanoseconds per foot of cable.

propagation velocity: The velocity a signal moves along a transmission line, as a percentage of the speed of light.

pulse: A current or voltage which changes abruptly from one value to another and back to the original value in a specific length of time.

putup: Packaging of finished wire or cable.

PVC: Polyvinyl chloride.

R

R: Symbol for resistance or a resistor.

radio frequency: The frequencies in the electromagnetic spectrum that are used for radio communications.

reactance: The opposition offered to an alternating electron flow by capacitance or inductance.

receptacle: A female housing with male or female contacts.

reference edge: See preferred term — index edge.

registration: Alignment of one object with relation to another. In flat cables it involves aligning conductors with contacts or solder pads. Also called register.

resistance: The opposition a material offers to current, measured in ohms.

dictionary of electronic and flat cable terms

R-F: Abbreviation for radio frequency.

RFI: Abbreviation for Ratio Frequency Interference.

ribbon cable: Flat cable of round conductors that have been individually insulated and bonded, extruded, laminated or woven together.

ringing out: The process of locating or identifying specific conductor paths by means of passing a current through selected conductors.

rms: Abbreviation for root-mean-square.

round conductor flat cable (RCFC): A cable made with parallel round conductors in the same plane.

routing: The path followed by a cable or a conductor.

S

self-extinguishing: The characteristic of a material that extinguishes its own flame after the igniting flame is removed.

semiconductor: In wire industry terminology, a material possessing electrical conduction properties that fall somewhere between conductors and insulators.

shield: An electromagnetic and/or electrostatic interference limiting material around or parallel to a conductor.

shield effectiveness: The relative ability of a shield to screen out undesirable radiation.

signal: Any visible or audible indication which can convey information. Also, the information conveyed through a communication system.

signal cable: Cable designed to carry current of less than one ampere per conductor.

signal conductor: A conductor in a transmission cable or line that carries a signal.

skin-effect: The tendency of alternating current, as its frequency increases, to travel only on the surface of a conductor.

spacing: The distance between the centers of two adjacent conductors. See pitch.

span: The distance between the center of the first conductor and the center of the last conductor in a flat cable.

spectrum: Frequencies or radiations that exist in a continuous range and have a common characteristic.

static charge: An electrical charge that is bound to an object. An unmoving electrical charge.

stranded conductor: A conductor composed of a group of wires, usually twisted together.

strip: To remove insulation from a cable or wire.

stripping grove: See tear feature.

surge: A temporary and relatively large increase in the voltage or current in an electric circuit or cable.

strip & retain: Method of preparing a jumper cable which leaves a portion of the stripped insulation on the conductor ends which keeps the conductors together and on center until time to solder into a PC Board.

T

tear feature: The controlled thinning of the lamination between two conductors in a flat cable to allow easy hand separation.

Teflon: DuPont Company trademark for fluorocarbon resins.

temperature rating: The maximum temperature at which the insulating material may be used in continuous operation without change of its basic properties.

terminal: Any fitting used for making a convenient electrical connection.

thermoplastic: A material which will soften, flow, or distort appreciably when subjected to sufficient heat and pressure. Examples are PVC and polyethylene.

thermal rating: The temperature range in which a material will perform its function without undue degradation.

transmission line cable: Two or more conductors placed within a dielectric material in such a way as to control the electrical characteristics.

transducer: Device for transforming mechanical energy into electrical energy and visa versa. Example, a microphone or speaker.

triboelectric noise: Noise generated in a shielded cable due to variations in capacitance between shielding and conductor as the cable is flexed.

twisted pair: Two lengths of insulated conductors twisted together.

thermosetting material: Materials which harden when heat is applied, then cannot be resoftened by heating. Examples are most rubber products

topcoated wire: Conductor produced by applying a layer of tin over a stranded bare copper conductor holding the strands together allowing easier soldering and preventing the fraying of strands.

U

UHF: Abbreviation for Ultra High Frequency, the band extending from 300 to 3000 mHz as designated by the Federal Communications Commission.

UL: Abbreviation for Underwriter's Laboratories, Inc.

unbalanced line: A transmission line in which the voltages on the two conductors are unequal with respect to ground, e.g., a coaxial cable.

V

v: Symbol for volt.

VA: Symbol for volt-ampere. A designation of power in terms of volts and amperes.

velocity of propagation: The transmission speed of an electrical signal down a length of cable compared to the speed in free space. Usually expressed as a percentage.

VHF: Abbreviation for Very High Frequency, the band extending from 30 to 300 mHz as designated by the Federal Communications Commission.

video: Pertaining to picture signals in a television system.

vlf: Abbreviation for Very Low Frequency, the band extending from 10 to 30 Khz as designated by the Federal Communications Commission.

volt: A unit of electrical pressure. One volt is the amount of pressure (or potential) that will cause one ampere of current in one ohm of resistance.

voltage: Electrical potential or electromotive force expressed in volts.

voltage drop: The voltage developed between two points on a conductor by the flow of current through the resistance or impedence of that conductor.

VWI: The flammability rating given by UL for cables wich pass a specific vertical flame test, formerly FR-1.

W

W: Symbol for watt or wattage.

watt: A unit of electrical power. One watt is equivalent to the power represented by one ampere of current under a pressure of one volt in a dc circuit.

waveform: A graphical representation of a varying quantity. Usually, time is represented on the horizontal axis, and the current or voltage value is represented on the vertical axis.

wavelength: The distance between the maximum points of a wave. The ratio of the velocity of a wave to the frequency of the wave.

wire: A conductor having a round or rectangular section, either bare or insulated.

web: The section of a flat cable between conductors.

XYZ

x: Symbol for reactance.

z: Symbol for impedance.

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